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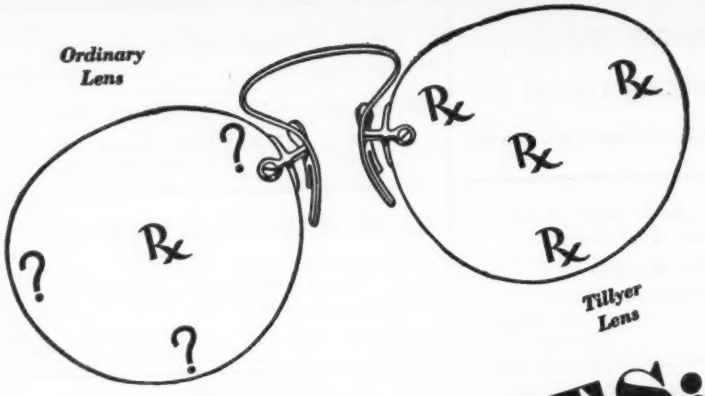

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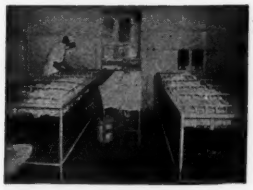

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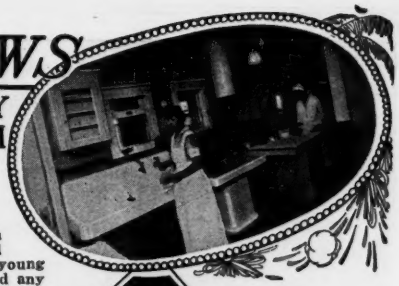

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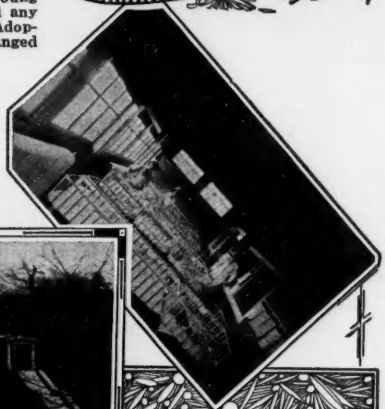

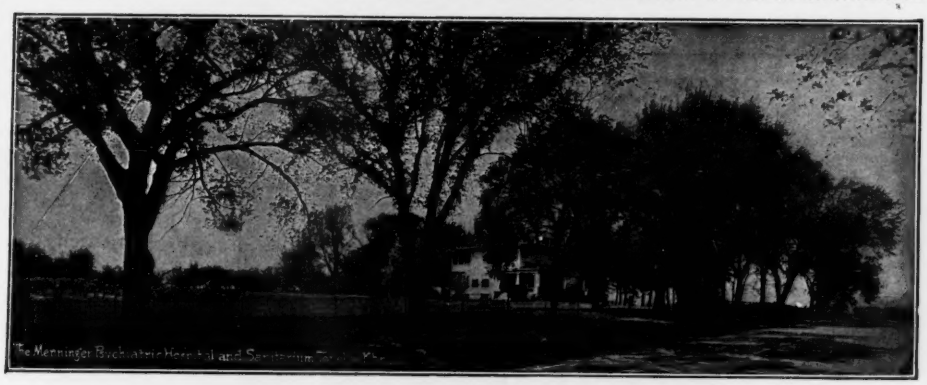

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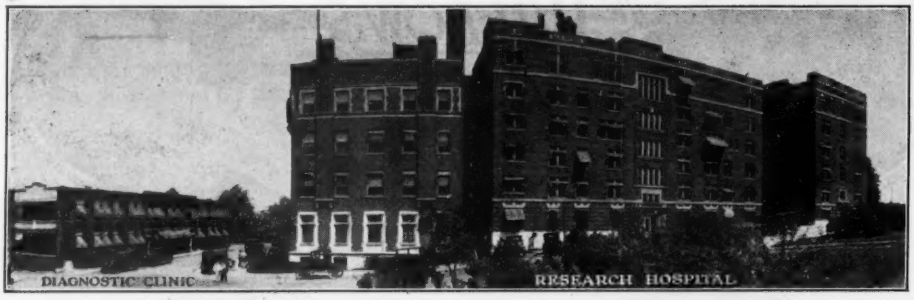

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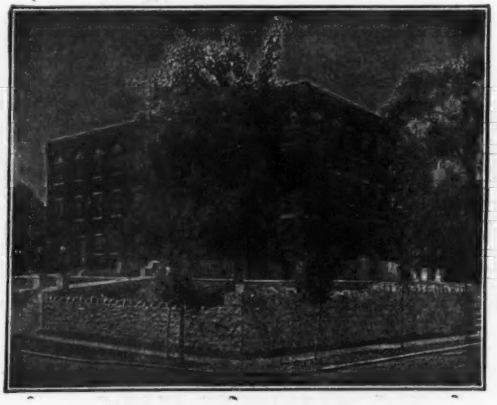

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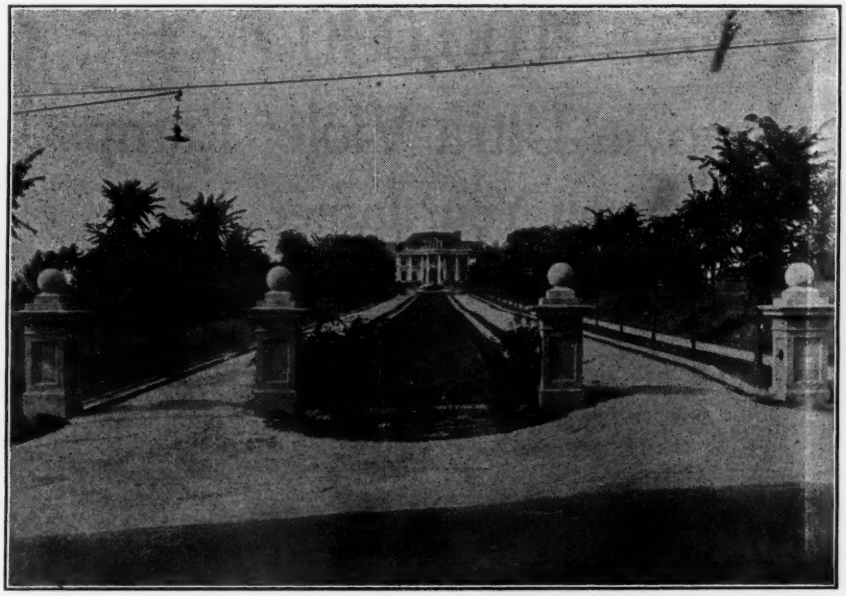

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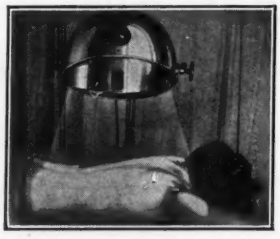

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THE JOURNAL
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Kansas Medical Society

VOL. XXIX TOPEKA, KANSAS, NOVEMBER, 1928 No. 11

How the Physician Can Help to Conserve Vision and Prevent Blindness

JOHN GREEN, M.D., St. Louis, Mo.

Read before the Kansas Medical Society at its Annual Meeting, May 8-10, 1928, at Wichita, Kansas.

I wish to speak to you of the opportunity and privilege—nay, as I see it, the duty—of every general physician in respect to the conservation of that most precious of human possessions, vision, and the prevention of that most terrible of human afflictions, blindness. But you will say to me that this duty is solely the concern of the eye physician.* I shall be glad to acknowledge that it is his concern, but I shall deny that it is his sole concern.

You will agree with me, I presume, that at least in rural communities, the appeal of the sufferer from any ailment or disability is first of all to his family physician. Inspired by a confidence engendered by years of skillful ministrations, the doctor is assumed to possess some knowledge of all branches of medical practice, so that his advice is sought in regard to ailments and malfunctions of all parts of the body. Burdened as he is with the multifarious and exacting duties and responsibilities of a general medical and surgical practice, it is not to be expected that the practitioner shall possess a detailed knowledge of ophthalmology. But he should have enough knowledge of eye diseases and injuries to act intelligently in ophthalmic emergencies, and to give sound advice when confronted by the questions of his patients concerning the eyes and eyesight of themselves and their children. It is the purpose of this communication to suggest what should be done, and what should be told.

The physician's first opportunity to save sight begins with the advent of the newborn child. If he is dealing with a maternal infection, he will be especially zealous in observing the condition of the baby's eyes for a week following birth. I assume that no one in this audience is so willfully negligent as to omit prophylactic "drops" in every case of confinement, no matter how remote may seem to him the chance of infection. Let us recall that a substantial minority of serious ocular infections in the newborn arise from microorganisms other than the gonococcus. There is therefore no reason to abstain from the use of 'drops" on the assumption that their use will cast a stigma on the morality of the parents. And what prophylactic shall be used? There is none better than the easily procured one per cent solution of nitrate of silver.

When the difficult labor calls for the application of forceps, the accoucheur should always bear in mind the possible chance that one blade may lie over an eye. The resultant pressure may produce a porcelain like infiltration of the cornea, a paralysis of one or more of the eye muscles, or lesions of the retina or choroid. Even more serious accidents, such as divulsion of the globe from the socket, have occurred as a result of the "gouging" effect of the end of the forceps blade.

When the infant has passed into childhood, the physician's advice is most frequently sought about eye injuries and cross eyes. It is not my purpose to discuss eye injuries in detail, but simply to state that apparently trivial injuries may have serious potentialities. One should never fall into the error of estimating the extent or the seriousness of an injury from the "looks" of the eye. Many a seriously injured eye may differ little in appearance from its uninjured fellow. The only safe course to pursue is to regrettable but undeniable fact that many

In this paper the term "eye physician," which has recently been suggested by the Guild of Prescription Opticians as a substitute for the frequently misunderstood and misused term "oculist," is used. As the name implies, it refers to the doctor of medicine who practices ophthalmology.

gard every eye injury as "serious" until searching examination and long observation have proved the contrary.

And now a word about "cross eyes." I am sure that eye physicians will agree that only in the rarest instances are cross-eyed youngsters brought under observation early. Usually the "do nothing" policy has been pursued for from one to five years. The mother, when chided for neglecting the child, falls back on the alibi that she was told that the child was too young to wear glasses, that a period of watchful waiting was the necessary precursor to a later operation. When interrogated as to the source of this information, the family physician is usually designated.

No one likes to furnish misinformation, and the physician, I imagine, would be a little touchy about giving parents advice about the ocular status of their children that must, perforce, be later branded by the eye physician as pernicious error. And how simple it is to give correct advice! Instead of counselling delay, advise immediate attention by the best eye physician you know. No child is too young to receive some form of ocular treatment looking toward the preservation of the vision of the squinting eye, though some are too young to make it feasible to fit them with glasses. It does not seem to be generally appreciated that the neglected squinting eye soon begins to lose its sight, and may, if the neglect be long continued, become practically blind. When that point has been reached, it is usually impossible to restore the lost sight. Such an eye may, indeed, be straightened, sometimes by glasses, oftener by operation, but it is useless from the standpoint of vision. If the cards were not stacked against the eye physician, most cases of squint could be cured. By "cured" is meant the restoration of vision of the squinting eye, the reestablishment of parallelism of the visual axes, and the development of binocular single vision. In some cases this could be accomplished by glasses and orthoptic training; in others, operation would be required as a supplementary procedure.

In respect to one eye disease that affects childhood and youth, every practitioner may, unwittingly, in the ordinary course of practice, do much to prevent visual impairment. It is now a well established fact that hereditary syphilis can, to an almost incredible extent, be prevented by intensive anti-syphilitic treatment of the expectant mother. If the child escape the other ravages of syphilis, it will escape the keratitis which, from the time of Hutchinson, has been part of the well known triad: interstitial keratitis, nerve deafness, and the characteristic teeth. If such a patient comes with the disease developed, a long course of specific treatment will usually partially restore vision.

And what of the other keratitis that so frequently attacks poorly nourished or improperly fed youngsters in the summer months? One is not apt to think of phlyctenular keratitis as a sight-destroying disease, but it is a very important factor in vision impairment. Jackson has recently pointed out that the thin, almost invisible corneal scars left as a result of the disease may, in later years, through the influence of the degenerative processes of age, become much denser, and lead to very grave visual impairment. An improvement in the living conditions and correction of improper diet are rather more important than local treatment. It is clear that the practitioner's general care in this disease may be quite as important as the local attention of the eye physician.

And now, as we follow our youngsters into the schools, we encounter a different type of ocular problem, viz., the struggle of the child with moderate or high errors of refraction to meet the requirements of study. The utter inability of a child with a high farsightedness or astigmatism to concentrate on the printed pages is well known to the eye physician. The struggle to use the tortured eyes in the acquirement of his lessons is often too severe, and he is relegated to the role of dunce, the despair of parent and teacher alike. How may a child with such a defect be discovered? Frequently he does not complain of his eyes at all. Finding that he cannot keep up, he follows the path of least resistance by refusing to study, an attitude which confirms the parent and

teacher in the belief that the youngster is dull.

Medical examinations in our public schools are by no means universal. I suspect that the vast majority of children attending rural schools are not examined at all. Even in the large cities the methods employed in examining the eyes are not sufficiently searching to discover all children who require spectacles. I do not know what may be the routine in the schools of Kansas. In St. Louis, the school physician or nurse makes a simple acuity test at twenty feet. If lowered acuity is discovered in one or both eyes, or there is found some obvious disorder of the anterior segment, a card is sent to the parents, stating that the child's eyes are in need of attention, and to seek advice from the family physician. Right here there is apt to be a slip. It is a rephysicians, in common with most of the laity, fail to discriminate between the optician and optometrist on the one hand, and the "eye physician" on the other. Even those that do discriminate seem to imagine that the optometrist is the one to be chosen for a fitting of glasses, while admitting that the eye physician is the one to handle inflammations and injuries of the eyes. Does the physician who thoughtlessly sends the youngster with poor sight to the optical eye tester around the corner stop to consider that by so doing he is betraying the confidence imposed in him by the public? An accurate determination of the refractive error in a child's eye (and without an accurate determination, the work had better not be attempted at all) cannot be made by the limited mehods which the law enforces on the optometrist. The latter, not being a physician, is not permitted to employ dilating drops, and without dilating drops, an eye test in a child is a ridiculous farce. I have recently examined a ten-year old youngster who, two weeks previously had been given glasses by an optometrist —minus spheres for an assumed myopia. The test under atropine revealed a total farsightedness of four dioptres. The patient accepted with good distance acuity and relief from headache and blurred vision, plus 2.5 sph. Similar experiences could be related, I am sure, by every eye physician.

The adult population will no doubt continue to patronize the optometrist. Some will be satisfied with his mediocre services. Others will eventually be forced to a realization that ocular comfort can only be attained by the thoroughgoing ministrations of the eye physician, and will voluntarily seek his services. In these days of legalized eye testing by non-medical persons, it is no more possible to prevent the public from visiting the optometrist than it is to keep them from buying bromo-seltzer at the drug store. But it is reasonable to expect that physicians shall refrain from abetting the unwisdom of patients by referring them to eye testers who, even in their chosen field, are compelled to adopt incompetent methods. And in the not rare case where deficient vision depends on intraocular disease, the consequences of an eye test by one not medically trained are dire indeed. Bright's disease, diabetes, tuberculosis, syphilis, focal infection—all may bear a direct causative relation to retinitis, choroiditis, optic neuritis, etc., and cannot be cured by a pair of glasses.

I do not know whether Kansas has yet been threatened by so-called "eyesight surveys." They are even now being conducted in Missouri. The method is as follows: An attractive circular is presented to the manager of a given industry setting forth the advantages that will accrue to the industry and the employees from a determination of the vision of employees. This survey is to be conducted by optometrists without cost to the employer, and, if glasses are needed, they will be supplied at reduced rates by the optometrist. All this sounds very attractive to the manager, who, no doubt, is one of the unthinking public who would go to an optometrist for his own glasses. The scheme is all the more alluring by reason of the fact that the optometrist brings his testing equipment right into the factory, and furnishes a record of the acuity and other data to the plant manager. As this is a purely commercial venture, every employee is a potential candidate for glasses. Those that need glasses are fitted (?) by the same

incompetent methods that obtain in the office of the optometrist. And again there is the same certainty that in some cases grave intraocular disease causative of poor vision will be overlooked.

I am not acquainted with the prevalence of trachoma in Kansas. In Missouri, more especially in the southwestern or Ozark region of the state, it is extensive and prevalent. The victims of this disease are for the most part very poor, and it may be that undernourishment, the handmaiden of poverty, is an important factor in its causation. If these patients are not destitute to begin with, they soon become so by reason of their incapacitating and chronic eye affection. If you encounter such unhappy victims direct them to one of the trachoma hospitals maintained by the U. S. Public Health Service. The one nearest your state is at Rolla, Missouri. Another is situated at Russellville, Arkansas. They are manned by thoroughly competent U. S. Public Health surgeons, experts in trachoma. One may feel assured that any trachomatous patient referred to either of these hospitals will receive modern scientific treatment. The hospital care and medical service is entirely without expense to the patient.

I presume that those of you who practice in agricultural communities have one or more patients with chronic inflammation of the tear sac. The trouble can be recognized almost at a glance: the eye is constantly watering, the lids are reddened and thickened, a purulent discharge is present. The diagnosis may be clinched by the appearance of pus on pressure over the site of the sac. Such patients are in constant danger of developing a serpent ulcer of the cornea with possible loss of the eye, and should be strongly urged to have the purulent sac removed, or its mucous membrane cauterized.

The subject of ocular injuries has been dealt with by one of my colleagues. I will only encroach upon his field to speak of the duty of the physician when he is consulted by the victim of a serious lacerating wound that has resulted in the total loss of sight and shrinkage of the globe. Every case of this sort carries, potentially at least, the danger of sympathetic ophthalmia. Many of these bearers of eye stumps are vastly more disfigured than if they were wearing a good fitting artificial eye. An appeal to their vanity is usually unsuccessful, as they have never taken much account of "looks." A simple, straightforward and earnest statement of the danger of sympathetic disease, and its rapid progress toward blindness, once it is established, will absolve the practitioner of any share of responsibility should blindness ensue as the result of disregarded advice. It has been my observation that such cases have usually occurred as the result of incompetent care of a serious eye injury by one who has had no eye training. Himself ignorant of the danger of sympathetic ophthalmia, he says nothing to the injured man of the possible danger to the uninjured eye, and the disease may be well established before the eye physician's services are sought. Remember, every blind shrunken eye is a possible source of danger. It would be much safer if all such eyes were removed.

The busy practicing physician usually loses all but the haziest recollection of his medical school eye course. But one thing he does remember, viz., that atropine is often used as an eye medicine. It is perfectly natural therefore that when he encounters an inflamed eye he will be apt to prescribe a collyrium containing this drug. If the inflammation is merely a conjunctivitis, the drug will not cure, but it will at least do no harm. But if the red eye is the congestion of an acute or subacute glaucoma, the most terrible disaster is almost certain to follow: an intense exacerbation of the trouble, with increase of tension to stony hardness, resulting in irremediable blindness.

The differential diagnosis between acute glaucoma and acute iritis is readily made by the experienced eye physician. He can then with safety apply the appropriate drops, pilocarpin or eserin, in the one case; atropine, in the other. If the practitioner be confronted with a symptom complex consisting of congestion, ocular pain, headache, and diminished vision, and there is the slightest doubt in his mind as to the differential diag-

nosis, *let him refrain from using atropine.* Better a thousand times that pilocarpin or eserin (miotics) be used in a case of iritis than that atropine (mydriatic) be used in a case of glaucoma. Better still, if a skilled eye physician be within a hundred miles of where you practice, put no drops of any kind into the affected eye, but rely upon the hypodermic or morphine to give temporary relief. Then without delay get your patient to the eye physician, and let him bear the responsibility of diagnosis and treatment.

This leads directly to a consideration of the immense responsibility that rests upon the practitioner in respect to that insidious destroyer of eyesight, chronic glaucoma. As silently as the passage of a cloud over the sun, this malignant enemy of eyesight creeps on its unconscious victim. The danger would be less if there were ocular pain, but that is rare. There may be temporary obscuration of vision, with the appearance of colored haloes around lights. It not rarely happens that one eye is blinded and the sight of the other seriously compromised before the diagnosis is made. Every eye physician will testify to the fact that only in the rarest instances does the victim of chronic glaucoma come under his observation sufficiently early to insure the full benefit of anti-glaucomatous treatment. He is compelled perforce to deal with eyes that have been almost wrecked by the disease too long unrecognized.

Chronic glaucoma is the great tragedy of ophthalmology. The blindness from chronic glaucoma could almost always be averted or indefinitely postponed but for the existence of three factors: first, the carelessness of the sufferer himself; second, the improper advice given to the sufferer by the family physician; and third (and I regret to be compelled to make this statement), the inability of some men professing to be eye physicians to make a correct diagnosis. To the middle aged or elderly person, failing vision is usually an indication for one thing only: stronger glasses. Nine times out of ten, these are secured through the optometrist who practically without exception fails to inform his patron of the existence of ocular disease, even if he suspects it. As the lenses provided usually slightly improve central vision, it is natural that the sufferer should return from time to time for a retest. Thus months and years may be frittered away before the eye physician has the first chance to make an examination.

Some sufferers, dissatisfied with their glasses, begin vaguely to suspect that something is wrong, and appeal to the practitioner for advice. Upon him (did he but know it) rests a heavy responsibility, one fraught with grave potentialities. Upon his answer may depend the momentous issue of future blindness or future sight.

It is not unlikely that the suspicion of "cataract" has entered the mind of the patient, and all too often this erroneous and fatal mistake is confirmed by the improper advice of the family physician. I take it that the "snap judgment" in practically all such cases is that the trouble is "cataract." Based on this erroneous diagnosis, improper advice is given, advice which leads to delay in seeking expert examination, and hence delay in securing adequate treatment.

Why is this sad error repeated day in and day out? The reason is not far to seek. Cataract is much more frequently the cause of failing vision than chronic glaucoma. It is not unlikely that in the nine preceding cases of this sort that have been brought to the attention of the general physician, the trouble was actually cataract, and the advice to "do nothing until the cataract is ripe," if not strictly in accord with the best ophthalmological opinion, did not preclude the eventual restoration of vision by operation. But the tenth case was not cataract, but glaucoma, and when, after the lapse of years the blinded eyes are presented to the eye physician, it becomes his embarrassing duty to explain to the physician the true nature of the case, and to try to square him with the patient whom he has permitted to drift into irremediable blindness.

Is not this a grievous picture, gentlemen, and one that challenges every one of us? To realize that through thoughtlessness one has given advice that has

led to such wretchedness! And how simple it is to avoid this pitfall! Let us grant that the diagnostic ability of the practitioner is insufficient to distinguish between chronic glaucoma and cataract. If the practitioner will assume that every case of failing vision in an elderly person not satisfactorily helped by glasses, and in which the patient himself suspects that "something is wrong," is *glaucoma,* he will have discharged his primary obligation to the patient. Knowing the hazards of delay in glaucoma, the practitioner will insist on an immediate examination by the most competent eye physician of his acquaintance. If the condition prove to be cataract in an early stage, the eye physician can greatly aid vision by the careful adjustment of glasses, local treatment, and hygienic regulation. If early glaucoma be present, appropriate treatment will give the patient the best chance of retaining his vision. By this simple change in attitude the number of cases of chronic glaucoma that reach the office of the eye physician beyond the possibility of help by treatment or operation, will be enormously lessened.

The danger that such conditions as retinitis and choroiditis may be overlooked is not great, as the impairment of vision usually leads the patient to consult an eye physician. Optic neuritis is usually attended by positive and alarming loss of vision, but not always. The mechanical stasis of the nerve head (choked disc), dependent on increased intracranial pressure, may not in its early stages cause visual impairment. Yet such eyes are seriously menaced. The best hope of preventing blindness lies in an early diagnosis of the intracranial lesion and operation by the neuro-surgeon.

A word in regard to school hygiene of the eyes. Some of you may be members of Boards of Education. Others may be in close touch with such members. All should be concerned with the proper lighting of schoolrooms, their ventilation, the use of textbooks with fairly large type, the installation of chairs and desks adjustable to the sitting height of the child. The education of the child with partial vision (albinos, congenital partial cataracts, corneal scars from trachoma or ophthalmia neonatorium, high myopes) is a special pedagogical problem, which has been met by the establishment, in large cities, of special classes for these defectives with special equipment for teaching them. I recognize the difficulty of handling the problem satisfactorily in smaller communities. Perhaps the ultimate solution will be the establishment of state schools for the semi-sighted just as now we have state schools for the blind.

If you have a commission for the blind or a state association for the blind, endeavor to learn its purposes and aims, so that you may be ready to enlist its aid should you encounter a person irremediably blind. As death marks the unsuccessful result of the patient's and the doctor's fight against disease and accident, so does blindness mark the failure of all agencies inherent in the patient and the eye physician to preserve sight. But while death ends all, blindness may be the beginning of a living death for him who does not receive spiritual guidance and above all the intelligent help of an agency fitted to cope with the problems of blindness. As in the dark hour of the passage of a soul to its eternal rest, you are able by kindly words and sympathetic bearing to give comfort to bereaved ones, so may you in the dark hour of blindness, give intelligent advice and encouragement to the unfortunate one who henceforth must live in the blackness of night.

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Management of Eye Injuries

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This paper is limited to the consideration of injuries to the eyes caused by foreign bodies, which comprise the largest number of injuries coming to the average physician for treatment. In rural communities as well as in cities a large number of these injuries are first seen by the general practitioner. In some instances it will be impossible for him to have the assistance of an ophthalmologist, or possibly the patient must be sent some distance before he comes under the care of a specialist. For this reason

every physician must have a considerable acquaintance with the diagnosis, care and management of eye injuries. With these facts in view the writer has endeavored to present the subject in a way which he hopes will be of interest to the general practitioner, rather than the ophthalmologist.

The rapidly increasing use of machinery in all types of industry has resulted in a commensurate increase in the injuries to the eye and its appendages. Statistics show that about one-twelfth of the non-fatal industrial accidents are accidents of the eyes, and about one-tenth of the blindness in this country is due to industrial injuries.[1]

As in all modern ideas of disease, an important factor in the management of eye injuries is the prevention of them. The wearing of protective glasses, and the placing of guards on machines will prevent the largest number of these injuries from occurring. This has been proven during the past few years by industries which have made compulsory the wearing of protective goggles by employes engaged in hazardous occupations, and the placing of guards on machines capable of producing flying fragments of metal. There has resulted from this practice a tremendous decrease in accidents to the eyes, caused by flying particles of steel, carborundum, nails, etc. The head of the safety department of one of the large railroads told me recently that in his company the number of eyes lost from such injuries has decreased from over a hundred in a year to less than a half dozen during the past year, since the compulsory wearing of protective goggles and the provision of guards on machines. He did not have available the exact figures, but that was an approximate proportion.

By these industries a goggle is furnished which will not shatter nor fly when struck by iron or heavy substances. These of course, furnish the maximum protection; any kind of goggle or glasses, however, furnishes great protection to the eyes of the wearer. No one should use an emery wheel, or use a hammer to strike iron or hard metal without having on at least a pair of glasses. Education along this line of prevention will save many eyes which are now lost every year.

The most common injuries to the eyes are those which occur as a result of blows in and near the orbit, flying particles of steel, iron, copper, brass, glass, and stone which strike the eye, lacerate the lids or lodge in the conjunctival sac, embed themselves in the cornea, sclera, and choroid, or penetrate deeper into the globe involving the anterior chamber, the iris, the lens, the vitreous and the posterior coats of the globe, or penetrate the entire globe and lodge in the orbit behind the globe. With considerable frequency are seen burns of the lids and eye, due to contact with hot metal and chemicals such as strong caustic solutions, acid solutions, and explosive flames.

A careful examination is of great importance in the care of any injury to the eye, no matter how trivial it may seem when first seen. Remember that an eye may harbor a small piece of steel within its structure without the knowledge of the patient, and without a definite history as to the time of entrance. He may come complaining of only a slight irritation of the eye or slight blurring of the vision, and assert that he has had no serious injury whatever. A careful examination including *x*-ray may reveal a metallic sliver or fragment in the lens, vitreous, or posterior segment of the eye.

This is illustrated by two cases which came under our care within the past year. The first was a young man who was driving a metal hoop on a barrel with a hammer and cold chisel. He felt something strike his eye and supposed some small piece of splinter or dust had flown from the barrel. He paid no attention to it and continued to work as usual for several days before coming to our office to see if we could see something in the eye. He complained of no pain, only a slight watering of the eye and moderate blurring of vision which he attributed to the watering. Examination with *x*-ray showed a small fragment of metal in the posterior segment of the eye.

The second case was a man who received an injury to the upper lid while driving a heavy piece of steel with a large sledge. The physician who first

saw him and made the examination, placed a bandage on the eye, and next day on account of the severe pain in the eye, sent him in (over a hundred miles on the train) to our office. Upon opening the lids, and exposing the upper fornix, there was found a rough arrow-shaped piece of steel about 8x4x3 mm. which had been in the eye twenty-four hours, causing the patient severe pain and the eye unnecessary irritation.

If the eye is painful and sensitive to light, the first step is to instil two or three drops of a sterile two per cent solution of butyn or cocaine. Cocaine solutions are not used so frequently as formerly on account of the roughening of the cornea it produces. Butyn does not have this disadvantage and produces good anesthesia. It does cause a moderate injection of the conjunctival vessels which is avoided if a few drops of 1 to 1000 epinephrine hydrochloride is instilled with it.[2] This anesthetic solution is instilled three or four times at five or ten minute intervals until the eye is more comfortable and the examination proceeds with much better results. The eye should be cleansed with a mildly antiseptic solution, and the skin surrounding rendered as nearly clean as possible. The lids are first inspected, noting whether there are cuts or punctures evident on the surface. Then the lids are separated with the thumb and finger so as to completely bring into view all of the cornea and as much of the sclera as is possible. This part of the eye is inspected generally with the object of noting whether the general anatomy of the eye is intact: that is, whether the cornea is smooth, the anterior chamber clear and filled, the pupil round and black, and the iris intact. If the anterior chamber is filled with blood it is impossible to view the cornea, lens and posterior segment of the eye with the ophthalmoscope.

The question may arise here as to whether or not the general practitioner should be familiar with the use of the ophthalmoscope. I believe he should have a working knowledge of this instrument. He has plenty of opportunity to practice its use, and by so doing he becomes more and more familiar with a most useful instrument. The neurologist is an example of a specialist other than the ophthalmologist who practices the use of the ophthalmoscope. I do not advocate that the general practitioner with insufficient training should attempt to diagnose pathological conditions of the fundus. I do believe, however, that he may learn to examine the cornea, lens and media of the eye, noting at least that they are clear, and deducing from his failure to see through them that a serious condition exists in the eye.

With the ophthalmoscope there may be seen puncture wounds or foreign bodies in the cornea, injuries to the lens, or foreign bodies in the anterior chamber, vitreous, or retina. As a general rule, however, it is impossible to see clearly the posterior segment of an eye retaining a foreign body on account of the damage done its structure, and the exudates encountered.

The *x*-ray has become the most useful of all aids in determining the presence or absence of metallic foreign bodies retained in the globe. With it even minute particles of metal can be seen and localized. This enables the operator to choose the most favorable route of removal. Fortunately the magnetizable metals are clearly shown by the *x*-ray, and are the ones which offer the best chances of successful removal through the use of the magnet. Copper, brass, glass, and stone fragments being non-magnetizable offer the greatest difficulty of removal, especially when situated deep within the structure of the eye, the last two being difficult, if not impossible, to demonstrate with *x*-ray.

Not many years ago it was the custom to subject an eye in which a metallic foreign body was suspected, to the magnet test. The magnet was applied and the presence or absence of a magnetizable foreign body was determined by the pull and pain experienced by the patient when the test was positive. This practice located many foreign bodies in the eyeball, and enabled many an operator to successfully remove them, but it had the disadvantage of the possibility of producing injury to uninjured parts of the eye by the moving of the foreign body violently toward the magnet, the oper-

ator not knowing the exact location of the foreign body. The magnet, however, is the most useful instrument we have in removing magnetizable foreign bodies from the interior of the eye after they have been located by the *x*-ray.

If a foreign body is suspected in the conjunctival sac the lids must be everted and careful search made with patient looking up or down so as to bring into view the upper and lower fornices. For small foreign bodies in the cornea, a magnifier or loupe is of great assistance. The Hardy-Beebe loupe is a good one and inexpensive. A little practice with this loupe will enable the wearer to easily see foreign bodies in the superficial layers of the cornea which are very difficult to detect with the eye alone. If no loupe is available, a pair of plus two or three lenses such as are found in the average home, worn over the operator's eyes or spectacles, will assist materially in locating such a small foreign body. If one is found it may be removed with a spud or bayonet pointed knife, provided the cornea has been thoroughly anesthetized. The lids are separated and the patient is directed to look straight ahead at some object which facilitates in keeping the cornea stationary. The foreign body is lifted from the cornea, care being used to denude the cornea of as little epithelium as possible. If the foreign body is fragile as in the case of cinders or emery, it may be removed in pieces and care must be used to see that none is left. After removal the conjunctival sac should be flushed thoroughly, a few drops of mercurochrome, two per cent solution, instilled and a bandage applied. With particles embedded deeper in the cornea considerable difficulty is experienced in their removal and more or less trauma is produced. In these cases it is well to add to the preceeding toilet one or two drops of an atropin solution, one grain to the ounce, and cover the margin of the lids with a one per cent yellow oxide of mercury ointment. The eye is then bandaged.

I am in the habit of putting a small gauze sponge over the eye, fastening it in place with adhesive strips, putting one strip across to the nose parallel with the lid margins, and two more at right angles to this from brow to cheek, thus endeavoring to keep the lids closed so that they will not come open with the use of the opposite eye. The patient is told that there will be some discomfort in the eye that day; that he may use an ice bag or hot water bottle, and to leave the bandage alone until he returns to the office the following morning.

A practice exists (which is all too common) of having some of the fellow workmen in machine shops endeavor to remove foreign bodies from the cornea. They frequently use a match which has been sharpened to a point to remove them, and while they probably are successful in many cases, in others they only succeed in burying the foreign body deeper, or denude the cornea to such an extent that, with the lack of antisepsis employed, an infection is occasionally introduced with a corneal ulcer as the result.

Some foreign bodies in the cornea are so minute that they are very difficult to find even with the loupe. If the pupil is dilated with a drop of homatropin or cocaine solution the cornea may be inspected with the ophthalmoscope using a plus 6 or 8 lens in the aperture. The smallest abrasion or foreign body shows up very clearly in this way, and may be removed with the help of an assistant who separates the lids, leaving the operator's hands free for the use of the ophthalmoscope with one and the spud with the other which is manipulated with the cornea in view through the ophthalmoscope. Do not forget that there may be more than one foreign body in the cornea, and that though one is found in the cornea there may be another under the lid.

Foreign bodies, especially rough fragments of metal, may be embedded in the bulbar conjunctiva, and these are frequently more difficult to remove than would appear. One may work without success trying to pick one of these out with a spud or knife. It will appear to be hopelessly entangled in the loose meshes of the conjunctiva. In this case the foreign body should be grasped with a small eye tissue forcep, and cut out with scissors along with the small piece of conjunctiva involved. If too much

conjunctiva is removed the wound may be closed with a fine silk ligature.

Blows directly against the eyeball cause a contusion of the globe which may result in the rupture of the globe necessitating the enucleation of the eye, or a dislocation of the lens or damage to the lens which may later result in traumatic cataract, or a paralysis of the contractor muscle fibres of the iris which produces a dilated pupil without loss of accommodation. Such dilatation of the pupil may last for days or weeks, and recover with good vision.

Lacerations, punctures, and burns of the lids are frequently seen. Punctures and cuts of the lids may also penetrate the globe. Injuries to the lids involving the lacrimal apparatus must be so treated as to preserve the integrity of the puncta and the ducts, that the function of lacrimation is not interfered with. Cuts and wounds of the lids must be treated antiseptically and closed with fine silk, horse hair or fine dermal ligatures, special care being used in those that involve the margin of the lid to secure as perfect approximation as is possible with a view to preventing the occurrence of entropion. I have seen within the past month, a case in which a cut of the upper lid was closed with metal skin clips with very nice approximation. With the edema which followed, the lid margin was inverted and the lower clip was in contact with the cornea. On this account I believe metal skin clips should not be used to close wounds which occur in or near the margin of the lids.

Burns of the lids and eye are treated best by the use of atropin, vaseline, picric acid ointment with local anesthetic or yellow oxide of mercury ointment, using care in the after treatment to prevent adhesions. All foreign bodies must first be removed.

In the edema of the lids, iced compresses are valuable to reduce the swelling. If infection occurs hot moist packs will hasten recovery, together, of course, with proper drainage.

Blows in the vicinity of the orbit may fracture the marginal bones of the orbit. These may be diagnosed by the presence of crepitus, by the deformity present, and by the *x*-ray. If there is not great deformity of the parts, treatment to reduce the inflammation is all that is required, while with certain marked displacement of the fragments surgical interference may be necessary to preserve the integrity of the orbit.

If a perforation is found in the anterior part of the eye, though minute and closed, a deep foreign body should be suspected and the case thoroughly examined to eliminate this possibility, or locate the offender if possible. This brings us to the consideration of the penetrating foreign bodies of the eye with retention which is entirely within the field of the ophthalmologist, and the patient may be sent to him if necessary as soon as possible after instilling atropin in the eye and using a moderate quantity of yellow oxide of mercury ointment with the application of a comfortable roller bandage. At the same time I believe the physician should administer an injection of Aolan or other foreign protein, 10 cc. in the case of an adult, deep intramuscularly. This treatment has been used by a great many for the past several years with reports of benefit, and in our own practice the use of foreign protein has seemed to prevent infection and severe reaction in many cases of injured eyes.

After the foreign body has been located it then becomes necessary to choose the route by which its removal shall be attempted. Those lying in the anterior chamber are best removed through a keratome incision at the limbus. If the fragment becomes caught in the iris an iridectomy is necessary to remove it.

Foreign bodies of the lens are frequently well tolerated and may be left alone to be removed later with the cataract which is usually formed. Iron and steel in the lens as well as in other parts of the eye are slowly disintegrated and give rise to the condition known as siderosis. This is the formation of iron oxide from contact with the tissues. Foreign bodies have been reported as having been tolerated within the lens for years without serious results to the globe. We have a case now in which a small piece of brass has been tolerated in the lens for three years. There is no irritability of the eye, and the patient

has so far refused to have the lens removed which has become cataractous.

In the vitreous and retina a foreign body is the most serious problem. There has been some difference of opinion as to the immediate necessity of the removal of a foreign body in the vitreous and posterior segment of the eye. It has been the teaching of most authorities to remove immediately when possible a foreign body in this location.

Albert E. Bulson[3] has recently reported three cases of his own, and cites thirteen similar cases reported in the literature, in which small metallic foreign bodies had been retained for months or years in the posterior segment of the globe without serious results to the eye. He concludes that in a large percentage of cases the patient is as well off if the foreign body is left in the posterior segment of the eye as he would be if it is extracted, particularly if the eye traumatism would be increased by the extraction.

Allport[4] states, "I believe it is wise to remove all intraocular foreign bodies, wherever located, as soon as possible, provided it can be done without almost irretrievable disaster to the eye itself."

Here are two opposite opinions. To the writer it seems that if the foreign body has been located and is magnetizable, and provided the eye is not infected and is reasonably quiet, it is best to remove the foreign body at once. Of course the removal does not insure that the eye will remain quiet. In fact, a great many eyes from which foreign bodies have been apparently successfully removed later become irritable and have to be enucleated.

Most of the foreign bodies removed from the globe, especially those of the posterior segment are necessarily iron and steel which are magnetizable. Those such as copper, brass, glass, stone, etc., which cannot be extracted with the magnet unless tolerated by the eye, mean its loss by enucleation. There is occasionally a non-magnetizable foreign body removed from the posterior segment of the eye, and this should be attempted when there is reason to doubt that a chance exists for its toleration. But those removed successfully are few, and the chances of so doing are slight.

Perforating wounds to the eyeball are fairly common, in which there is no foreign body retained within the eye. The location of such injuries is of great importance.

James B. Stanford[5] of Memphis, considers that the danger of infection is in direct ratio to the length of time the wound is left open, and believes in immediate operation which consists in a toilet of the wound and the covering of the wound with a flap of conjunctiva.

In the wounds of the cornea especially at or near the limbus there is frequently encountered a prolapse of the iris. This is readily recognized by the irregularity of the pupil and the plug of the iris sticking in the wound. It is usually considered necessary to perform the iridectomy very soon after its inclusion, and this is the time when it should be done. However, I have done an iridectomy on an eye which was becoming more and more irritable, on the seventh day after its inclusion, with an immediate quieting of the irritability of the eye. This patient had been sent in to us five or six days after the injury occurred.

In lacerations of the coats of the eyeball back of the ciliary body there may be so much loss of vitreous that the eye is soft and enucleation necessary. It is so difficult to tell when too much vitreous has been lost that it is best when possible to close the wound with a flap of conjunctiva and give it a chance for recovery. These soft eyes are not painful and a few days time will tell whether or not they merit further tolerance.

Every case having a serious injury to the eye will do better if put to bed and kept quiet with an ice bag in contact with the eye. These are the most difficult cases to keep quiet, because they commonly believe that an injury to an eye should not keep them from being about. I have seen eyes which were quiet and doing nicely while in bed, show a severe reaction with serious complications upon the patient's being allowed to get out of bed and exercise. In the use of ice bags care must be taken to furnish the patient with a light weight bag which can be laid on the eye without too much weight be-

ing brought to bear. It is not infrequently seen that the patient has an ordinary ice bag such as is used in general treatment, lying on an injured eye, with consequent pain and damage to the eye.

There are no injuries which so necessitate prompt and careful treatment as those occurring to the eyes. The prevention of them is of first importance by the wearing of protective glasses and providing guards for dangerous pieces of machinery. A careful examination only will prompt the proper advice and treatment, and prevent the possibility of overlooking serious injuries which may cause the loss of one or both eyes. It is necessary that every physician have a considerable general knowledge of this class of cases, with a fair idea of the prognosis and treatment required.

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"Acidosis"

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Along with gout, diabetes mellitus, diabetes insipidus, rickets, obesity, lipomatoses, hemochromatosis and ochronacis is included acidosis. All classified as diseases of metabolism, in the ninth edition of Principles and Practice of Medicine by Osler and McCrea. These authors state that acidosis is not a disease in itself, but the outcome of the disease which it complicates may depend on the acidosis and its response to treatment may be regarded as an important element in estimating the outcome.

They define acidosis as a decrease in the amount of fixed bases in the blood and other tissues of the body or in other words a relative increase in the acid ions. This involves a decrease in the alkali reserve of the body and hence a disturbance of the acid base equilibrium. This might better be described as a decrease in alkalinity; an actual acid condition not being present.

The free carbon dioxide in the body converts the bases not bound by other acids to bicarbonate and hence the bicarbonate represents the excess of base remaining after non-volatile acids have been neutralized. It follows that acidosis involves a depletion of the bicarbonate in the blood. A definite acid base equilibrium is essential to life and any marked departure from it results in serious difficulty. This equilibrium is kept at a very constant level and any increase of acid or alkali is automatically guarded against. Under ordinary conditions of diet there is production of acid radicles which are disposed of by oxidation, elimination, excretion and neutralization. The means by which the normal ratio is maintained are: Elimination of carbon dioxide by the lungs, elimination of acid by the kidneys, neutralization of acid by ammonia and intake of fixed bases with the food. It is evident that oxidation plays a large part in the process. In disturbance of the usual acid base relaxations the body endeavors to protect itself by an increase in the normal processes. One important means as increased neutralization of acid by ammonia. The ratio of this to the total nitrogen of the urine, which normally is two to five per cent, may rise to twenty-five or even forty per cent. By an increased respiration rate the effort is made to excrete more carbon dioxide by the lungs. The kidneys may excrete more acid than in normal conditions and the reserve of alkali is used so far as it is available. These means, however, may not be sufficient and it is evident that a decrease in the amount of sodium bicarbonate will result in less carbon dioxide being carried from the tissues and hence an accumulation of it there. From this dyspnoea and air-hunger result. So long as the reduction in the alkali reserve is not marked the condition is not serious, but if this does result many changes follow, such as disturbed oxidation, disturbed renal function, altered nitrogen metabolism, dyspnoea, etc.

The mechanism of this decreased alkalinity is various. In diabetes mellitus there is excessive formation of acetone bodies. In certain of the diarrhoeal diseases it may be that alkali is excreted by the bowels and this probably occurs in cholera. In such cases there is great loss of fluids and under such circumstances the kidneys are unable to in-

crease excretion to meet the emergency. Osler further states that acidosis may occur in many diseases, in some of which it is of slight significance only, in others of extreme gravity. We are now aware that it does occur in most diseases and that its significance is always important. Formerly it was not thought of save in advanced cases of diabetes, but more recently it is a recognized condition in a large per cent of diseases.

Sajous says in his Analytic Cyclopedia of Practical Medicine that apart from the acidosis of diabetes there exists a not uncommon form, which is met in patients subject to habitual constipation and other gastro-intestinal disorders, especially gastroptosis and after anesthesia. This he designates as the alimentary form of acidosis, due to the bacterial putrifaction of the contents of the gastro-intestinal canal and probably to betaoxybutyric acid and acetylacetic acid formed when the intestinal fats are split into fatty acid and glycerine. These acids preserve their identity in the alimentary canal, but when they reach the blood and tissues they are finally broken up into acetone and carbon dioxide. It is only when an abnormal amount occurs in the blood that the morbid phenomena of acidosis are awakened. This is probably the result of a gradual reduction of the tissue alkalies until a point is reached when the latter are inadequate for normal metabolism. Under these conditions an insufficient amount of alkali is ultimately available for the neutralization of the acid, the direct cause of poisoning. In carnivorous animals, and also man, the tissues oppose the acid by supplying ammonia and alkaline carbonates to neutralize it, but as fresh doses of acid are added this defensive resource is gradually weakened. Finally the time comes when the alkalinity of the blood is so low that its power of taking up the carbon dioxide formed in the tissues is seriously impaired. The carbon dioxide being retained in the tissues gradually increases therein until symptoms of asphyxia, including cyanosis and coma appear.

A list of diseases and conditions not including diabetes, in which acidosis occurs include, starvation, anesthesia, pregnancy, diarrhoeal diseases of children, infections and disease of the kidneys and heart.

We are only beginning to realize the importance of diet as a factor in disturbing the normal alkaline balance of the body. All foods, when digested and absorbed leave an ultimate residue which is either alkaline, acid or neutral. Practically all animal foods together with the cereals are acid producing, and when not properly balanced by alkaline producing foods, such as fruits, vegetables, leafy plants, milk, etc., reduce the normal alkalinity and interfere with perfect metabolism. If proper attention were given to the selection of a balanced diet acidosis would be comparatively rare, in fact it is questionable whether it would ever occur. It has been conclusively proved experimentally that the smallest increase of acidity has a markedly deleterious effect on the phagocytic powers of the leucocytes and on nutrition, and it constantly happens in all infections that the hydrogen-ion concentration of the blood is too great, due to the presence of acid products of abnormal metabolism.

It requires no strain of imagination to realize the importance of proper diet. The human body as originally created was a perfect mechanism composed of certain elements that required constant replenishment, which is available only through proper food. Its importance was indicated by the Creator whose first command to man related to diet. The almost universal disregard of balanced diet is the foundation stone of all disease. Only in very recent years has this all important question received scientific consideration. Physicians are not sufficiently awake to its importance and too often give scant consideration to the amount and quality of the food their patients receive.

We are all agreed that a building is only as good as the material used in its construction and that satisfactory repair demands the use of material like that used in the original construction. The same may be said of our bodies which are also buildings. In addition these buildings require constant supplies of certain elements to properly maintain

life and health throughout its allotted span. Neglect to give proper attention to this all important question results sooner or later in disease and premature death.

Only marked acidosis becomes clinically evident, and then the patient complains of headache, drowsiness, weakness and eventually increase of respiratory movements. When this stage is reached acidosis has become an important factor in prognosis. Long before such symptoms are evident the accurate determination of its existence, degree and course are necessary for the special reason that the effectiveness of other therapeutic measures employed will be dependent upon the proper alkaline balance.

Acidosis can be accurately determined by blood examination; this, however, is complicated and requires expensive laboratory equipment. A simple test that is equally reliable consists in the administration of alkaline substances at stated intervals until the urine becomes alkaline in reaction. Bicarbonate of soda is commonly employed although many express a preference for sodium citrate which is more palatable and not so likely to produce diarrhoea. A proprietary preparation known as Alka-Zane is to be preferred when available, for the reasons that it is palatable, a balanced preparation of sodium, potassium, calcium and magnesium salts, in effervescent form. The test is carried out by administering orally one level teaspoonful in a glass of cold water every two hours, until the urine becomes alkaline as indicated when it turns red litmus paper blue. Normally this should occur within an hour after administering the first or second dose. Unless this occurs it may be presumed that the hydrogen-ion concentration of the blood is excessive and alkaline medication should be instituted. It should here be remembered that unless the urine is decidedly alkaline, which is not at all likely, then time must be given for the reaction to take place. It is important to note here that proper and sufficient food will restore the acid-base balance and maintain it at the required level, but unfortunately the patient's digestive and assimilative powers are generally so impaired by the disease condition that this method of re-establishing and maintaining the acid base balance becomes impracticable. This appears increasingly evident when one considers that even a larger intake of alkalizing foods would be necesary than in health, to take care of the increased demand placed on the alkali supply of the body. It may here be noted that oranges freely eaten will aid materially in rendering the urine alkaline, are not objectionable to most people and are usually easily obtainable. They are especially valuable as a means of maintaining alkaline balance after it has been restored.

To those who take thought it must be plainly evident that physical health demands physical balance, obtainable only through the daily consumption of a well balanced diet. The old saying, that most people dig their graves with their teeth, is too near the truth to be considered a joke.

At a recent public meeting in Philadelphia, E. V. McCollum delivered an address on the subject, "How to keep the human family from starving on a full stomach," and in conclusion remarked that the entire address could be stated in five words as follows: "Drink milk, eat leaf vegetables." This should not be taken to mean elimination of all other food but rather an addition of such food as is now known to contain necessary elements not found in meats, milled cereals, etc.

Foods of today bear very little resemblance to those of our forefathers. Can you imagine Adam and Eve, after ejection from the Garden, seeking a grocery store to procure a steak and loaf of bread for their evening repast? Their only recourse was cereals, vegetables, fruits, etc., in their fresh state as nature prepared them, gathered from the open fields and forests. The foods of today are nearly all prepared for us by processes of refinement that too often remove elements that are essential to health and life.

We were not aware of the existence of such substances as vitamines until the development of deficiency diseases due to their absence. The results of experimental feeding in the absolute eradication of a number of already recognized

deficiency diseases, are convincing beyond per adventure of doubt. As instances I cite the experiment in the Japanese Navy. Beri-beri, a peripheral neuritis resulting in paralysis, had been known from remote times and in 1884 it was demonstrated beyond doubt that in the Japanese Navy it was due to faulty diet.

Under the direction of Admiral Takaki a ship made a cruise of eight months, during which time the incidence of beriberi among the sailors was carefully noted. Another ship was then manned and sent on a cruise over the same course with an improved dietary furnished the men. The effects were so striking that the diet of the army and navy was improved, with the result that thereafter the disease practically disappeared.

Xerophthalmia or dry eye may be produced readily in experimental animals. Dr. Sansum tells of having prepared a rat for the purpose of demonstrating this disease to a medical clinic. On a Saturday afternoon the animal was suffering from a typical xerophthalmia and was in imminent danger of losing one eye. As the class did not meet until the following Tuesday, a teaspoonful of cream was given, only to find that when Tuesday arrived all symptoms of the disease had disappeared.

Sansum says the term acidosis was used originally to designate a condition in which acetone bodies were found in the urine. It is now used more generally to indicate any condition in which the body is less alkaline than it should be. He subdivides acidosis into two types, the acid ash type and the acetone type. The more common symptoms of the acid ash type are, malaise, lassitude, nausea and later vomiting, loss of appetite, headaches, weakness, sleeplessness, muscle aches, acid mouth, sour stomach, acid urine, acid sweat, sour disposition and blood vessel disease which is responsible for high blood pressure and such complications as partial blindness, heart disease, kidney disease, gangrene and apoplexy.

In as much as the acetone type of acidosis is due mainly to diabetes its consideration would best be left to a study of that disease. Until late years it alone received consideration, but the remarkable advancement in the knowledge of scientific nutrition has changed our viewpoint and we are beginning to recognize that underneath all pathological processes there is disturbance of balance and that long before diabetes is diagnosable subtle changes are taking place that ultimately result in the appearance of acetone bodies and other serious disorders.

If we give but casual consideration to the foods upon which people in general are now living we are at once aware that in the main they are of the acid ash type and as a result the constant tendency is toward acidosis. Our grains are milled, our fruits and vegetables canned and our meats preserved, thereby often removing the chemical constituents and destroying the vitamines.

Originally all food was consumed in the raw state, today the universal demand is that everything eaten must first be cooked, even though many articles of diet are more palatable and nutritive in the raw than in the cooked state. Many diseases are designated as contagious and the same could be said of health did we but give more thought to the selection and consumption of a well balanced and properly prepared diet. If the same thought and care were used in the selection of the food we consume as is used in the selection of the gas and oil for our automobiles our bodies would function much more perfectly and continuously.

To find urine that gives an alkaline reaction is practically unheard of and an acid reaction is considered normal; however, Sansum states that any urine acid enough to turn blue litmus paper red is too acid and indicates acidosis. If this be true a very large per cent of the world's population has acidosis. I maintain that this is true and for the evident reason heretofore mentioned, the modern dietary.

Acidosis then should be considered a universal symptom that complicates all diseases and demands treatment along with all other remedial agents. It is to be recognized that underneath any and all methods of treatment comes that of restoring balance, a necessity that will

continue as long as the diet contains an excess of acid ash foods. Because of the lack of attention to proper diet we are put to the necessity of employing artificial means to restore the normal alkaline reserve, which is but temporary and continues only so long as the remedies are administered. With the adoption of a well balanced diet persistently used acidosis disappears, but this requires time for its accomplishment and continues only so long as due attention is paid to diet.

In conclusion permit me to call your attention to two cases illustrative of the importance of diet, as related in Goudiss' book on "Eating Vitamines." G———, American, banker, aged 41. Underweight. Guided in his diet by a high priced, conscientious expert, fed exactly the number of calories decreed for him on the basis of the Atwater formulae. Continues to lose weight. V———, Italian laborer, aged 56. Works 8 hours a day, laying sewer pipes. No regimen, daily lunch: 4 thick slices of bread, 4 red-ripe tomatoes. Works well, no fatigue, normal maintenance of weight.

Now there are 1620 calories in a pound of roast beef and 75 in a pound of tomatoes. The caloric content of tomatoes is little more than that of spring water colored red. Evidently something was wrong with the caloric theory. Science wondered and attacked the problem from another angle. It stopped analyzing foods and began to study their effect. If anything approaching the results observed in the case of the middle age Italian laborer is obtainable, then it would seem wise for doctors generally to use these first aid means in the treatment of disease conditions generally.

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The Use of Compressed Air As a Therapeutic Agent

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The treatment of pathological conditions in the human body is today beset with innumerable uncertainties and disappointments due to a great variety of unknown causes but chiefly perhaps to our meager and inadequate knowledge of the proximate composition of protoplasm and the extreme chemical and biophysical lability of the colloidal complexes which constitute the cell. The diagnosis of disease rests upon a far firmer scientific foundation than does the treatment of abnormal states. Medicine is yet largely an art so far as therapy is concerned and seems destined to remain so for some time to come.

And yet we are making notable headway in rationalizing therapeutic procedures, in translating them as it were from the class of trial and error to the more satisfactory category of cause and effect. Strictly empirical remedial agents are being used less and less each year. The thoughtful modern physician insists on knowing why he gives a remedy even though he has knowledge, from clinical experience, that certain results may be obtained from its use. To be sure the answers he receives to these scientific inquiries are vague and unsatisfactory in most instances but definite progress is being made nevertheless along these lines.

One conspicuous advance in therapeutic practice in recent years has been a shifting of emphasis on the relative importance of vegetable and mineral drugs in modifying pathological processes. While drugs have by no means been abandoned the polyvalent prescription with its many chief ingredients, adjuvants and correctives, so popular twenty years ago, has all but disappeared. A few doses of a simple remedy usually suffices. In the place of an almost exclusive drug regimen, rest, pure air, proper food, physical, radient, and occupational therapy have come to play a major part in the successful treatment of disease. These procedures have come to be considered rational remedial agents, and in this sense scientific, largely because their employment seems more normal to the call and its environment. Measures of this sort are preferred because they introduce little or nothing that is foreign to the cells' protoplasm and therefore, if effective at all, may logically be assumed to recondition the diseased cell in a gentler and more natural manner.

The use of oxygen in the treatment of disease is increasing with each year that goes by. This element can scarcely be

called a drug in the ordinary meaning of the term and yet we know that in pathological states it does become a powerful therapeutic agent. In all conditions for example where an anoxemia can be shown to exist the use of oxygen rests upon strictly scientific considerations. It can be experimentally shown that by increasing the tensions of oxygen in the alveolar air, anoxemia is relieved. The oxygen saturation of the hemoglobin of the arterial blood is increased and may, in certain instances, reach a saturation value about three per cent above that ordinarily found in the strictly normal individual. The value of oxygen in a variety of other empirically determined conditions seems also inferentially justifiable because of the intimate and important role which oxygen plays in cellular metabolism. The probabilities are, that, more than any other element, oxygen tends by the intracellular oxidizations which it makes possible, not only to keep the normal cell in a healthy condition but also to restore this condition when the cell has become diseased.

It is an unfortunate fact that a great many members of the profession have come to think of compressed air, either as an old, useless, ineffective discarded therapeutic measure, or as something entirely new which needs clinical and experimental verification and demonstration before it can be accepted or used in an orthodox way in the treatment of disease. To them the connection between compressed air therapy and oxygen therapy, or the use of oxygen enriched air, seems very remote, when as a matter of fact the two procedures are therapeutically identical. Hundreds of articles have appeared in the most reputable of our medical journals during the past decade, discussing the benefits of oxygen and oxygen enriched air in a large variety of diseased conditions. Reputable physicians are today using oxygen in a variety of ways in the treatment of disease. And yet I doubt if there is a single result recorded in these articles or obtained by these men, excepting perhaps, those referring to injection of oxygen, which cannot be duplicated in compressed air properly used. The experimental evidence which justifies the use of oxygen in disease gives like sanction to the use of compressed air. They are both forms of oxygen therapy; the latter is as scientifically legitimate as the former. Therapeutically they are related to each other as quinine capsules are to quinine pills.

The use of compressed air in the treatment of disease dates back to the 17th century. The historical aspects of the subject are very interesting but not particularly important or instructive. The literature is surprisingly large but the observations recorded are vague, uncontrolled, and contradictory. We know today that the data is of comparatively little value because, in the first place, the pressures used were too low to produce therapeutic effects and, in the second place, the time given over to the treatment was too short to be effective. Barach has recently come to the conclusion that oxygen concentrations of less than thirty per cent of an atmosphere are ineffective for therapeutic purposes while concentrations of from forty to sixty per cent are of decided value. The older experimenters used oxygen pressures too low to be therapeutically useful. This explains in large measure the reasons for their failures to put compressed air therapy on a firm footing and to establish the use of compressed air as a valuable therapeutic agent. If anti-toxin or insulin were today restricted to single unit doses instead of given as they now are they, too, would be discarded as worthless in a short time in spite of the tremendous intrinsic values which they possess. The compressed air therapy of the past was bound to fail as surely as will ineffective doses of any other valuable remedy.

From a theoretical point of view oxygen therapy, in any of its forms, resolves itself almost entirely into consideration of the partial pressures of oxygen developed in the air or oxygen mixtures used. It may therefore be pertinent in this connection to review a few of the elementary principles of the mechanics of air, and to recall the ways in which oxygen is carried in blood. Ordinary air is a mixture of several gases chiefly oxygen and nitrogen. The sum of the partial pressures of all the atmospheric gases

total 760 mm. of mercury at sea level. The partial pressure of oxygen in air is 1/5 of 760 mm. or 152 mm. of mercury. In the alveoli of the lung, where the carbon dioxide content is much higher than in ordinary air, the partial pressure or tension of the oxygen is reduced to about 100 mm. of mercury. At 100 mm. tension of oxygen, in the alveoli of the lung, the hemoglobin of the blood of a healthy individual, when breathing is normal, is saturated to the extent of about 96 per cent. From 18 to 22 cc. of oxygen, measured under standard conditions, are thus stored as oxyhemoglobin in every 100 cc. of blood, ready to be "retailed" to the tissues, through solution in the blood plasma, as needed. In addition to the oxygen contained as oxyhemoglobin in the red blood corpuscles, blood plasma holds, at ordinary pressures, about .3 per cent of oxygen in physical solution. The amount of oxygen held as oxyhemoglobin, is limited by the saturation capacity of the hemoglobin present in the blood. The amount of oxygen held in physical solution depends, in the normal individual, directly upon the tension of oxygen in the alveolar air. It is the oxygen in physical solution in the plasma which first diffuses from the blood into the tissues. The diffusion pressure of oxygen depends therefore, in the first instance, upon the tension or "head" of oxygen in the plasma.

The tension of oxygen in the blood may be effectively increased in two ways. It is increased either by allowing an individual to breathe oxygen enriched air, at ordinary atmospheric pressure, or by compressing ordinary air, without enriching it with oxygen. The net effect in each instance is an increase in the partial pressure of oxygen. The therapeutic effects of oxygen lie, so far as we know today, solely in the increased partial pressure of oxygen available in the air of the oxygen enriched mixtures used. By compressing air the partial pressure of oxygen is increased and ordinary air is thereby made therapeutically identical with oxygen enriched air. Compressed air properly used will then do anything and everything which oxygen enriched air will do. When the oxygen tensions are identical the therapeutic indications must be the same. Ordinary air enriched with oxygen to 60 per cent of an atmosphere has an oxygen tension of 456 mm. of mercury. This tension of oxygen is equalled by compressing air to three atmospheres absolute (30 pounds gauge).

There are many reasons which point to the superior effectiveness of giving oxygen by compressing ordinary air rather than by enriching it with pure oxygen. In the first place, a patient in compressed air is at all times fully immersed in the air which he breathes. Every breath he takes helps effectively to bring the blood and tissues to higher saturation levels of oxygen. Compressed air, moreover, remains at all times diluted with nitrogen in exactly the same proportion as is found in ordinary air. By giving compressed air in a chamber combersome face masks and inhaling devices are eliminated. The air by constant renewal, is kept fresh at all times, thus doing away with high concentrations of carbon dioxide and the rebreathing of "stale" air. By properly cooling compressed air, and removing moisture by refrigeration, an "artificial climate" is created which is extremely attractive and relaxing to the patient. The cost of producing compressed air for therapeutic purposes may be somewhat higher than that of producing oxygen enriched air, but the stimulating physical and psychic effects, produced by regulating the temperature and amount of moisture, in addition to increasing the oxygen tension, is well worth the extra expense. If there are any benefits to be derived from a change of climate, in so far as variations in such purely physical factors as temperature and humidity are concerned, this may be effectively and delightfully realized, as a by-product, in compressed air. These physical factors may become of considerable importance when treatments are taken extending over periods of five or more days as seems to be customary in treating chronic diseases in the oxygen chambers at Stoke on Trent and other places in England.

The fact that compressed air therapy is an effective and real form of oxygen therapy is born out by other than theoretical considerations. If, for example,

a normal individual is given oxygen to breathe for a short period of time it is noticed that the pulse decreases in frequency, the respiration becomes slower and deeper, the breath can, after a time, be held longer. The saturation of the hemoglobin of the arterial blood increases from 96 per cent to about 99 per cent. The oxygen in physical solution is increased according to Henry's law and by this means the increased diffusion pressure raises the oxygen tension of the blood and tissues. All of these effects are noted in precisely the same manner in individuals breathing compressed air.

Hill and Flack have shown that normal men can perform physical exercise with less fatigue and dyspnea when oxygen is added to the inspired air. Briggs has demonstrated that this is especially true when the individual is unfit although oxygen enriched air assists even the normal man in an overload. The experience of engineers and physicians in charge of men working in caissons indicates that physical labor is carried on with greater efficiency and less fatigue in compressed air than in ordinary air. Haldane says, "With a fresh supply of air hard exertion is actually easier to the diver at some depth than near the surface on account of the higher oxygen pressures."

In the pathological individual there is found the same relief of symptoms in compressed air that is noted in individuals breathing oxygen enriched air. Oxygen therapy is especially indicated in all conditions in which the saturation of the arterial blood is below normal. Haldane states that: "Anoxemia is a common condition among ordinary patients and well worth taking early measures to prevent. Even a slight lowering of the arterial oxygen saturation has a serious effect on the individual." Shallow breathing produces in the normal individual an anoxemia even when the alveolar air is normal in composition.

The most spectacular effects of giving oxygen is noted in the relief of cyanosis and air hunger in cases of arterial anoxemia due to obstructive exudates in the lung. These cases are as promptly relieved in compressed air as in oxygen enriched air. The relief of localized edema, the healing of chronic indolent ulcers, the improvement of circulation in stumps of amputated limbs, reported by English investigators as a result of treatment by oxygen enriched air can all be easily duplicated in compressed air. Whitridge Davies in a recent lecture on oxygen therapy to the British Medical Society asserts that not only can the arterial form of anoxemia be relieved by oxygen but also the stagnent and anemic forms can be overcome more or less completely. In the anemic and stagnent types of anoxemia the amount of oxygen in simple solution must be increased since the hemoglobin is holding all it can. This can only be done effectively by increasing the partial pressure of the air in the lungs.

Oxygen and oxygen enriched air have been used in a great many diseased conditions. Competent investigators have published data in our best Medical Journals on the successful use of oxygen in more than a score of well known diseases. Dr. John H. Evans has within the past five months presented to the Buffalo Academy of Medicine a most interesting and valuable report concerning the use of oxygen in a number of pathological conditions. Ever since Lorrain Smith, some thirty years ago, first called attention to the toxic effects of high tensions of oxygen in normal animals it has been considered an established fact that oxygen in concentrations exceeding sixty to seventy per cent could not be used as a therapeutic agent for man for any considerable length of time without producing severe irritation of the pulmonary epithelium leading to pulmonary edema and fatal pneumonia. Evans has found that oxygen concentrations of one hundred per cent are well tolerated by patients for two weeks or more whenever an anoxemia actually exists. Not only is pulmonary edema not produced under these conditions but it is actually relieved if present. Dr. Evans administered pure oxygen continuously for five and a half days to a twelve-year-old girl suffering from meningitis. There was no lung pathology. At no times, says Dr. Evans, was there any edema, rales, or cough indicating that oxygen was acting as an irritant. If these results are

substantiated it is apparent that oxygen in the anoxemic patient differs in its effects from what it does in the healthy man or animal. This, Dr. Evans points out, is precisely what happens when ordinary physiological salt solution is administered subcutaneously. In the dehydrated patient it is quickly absorbed and well tolerated while in the normal individual it is absorbed very slowly and seems to act as an irritant.

Fischer and Anderson have recently shown that oxygen concentrations of sixty per cent of an atmosphere destroys carcinomatous tissue in vitro and that oxygen concentrations of 1.6 atmospheres will destroy carcinomatous tissue in vivo. Marsh has reported within the year that mice thrive and breed after twelve months of exposure to thirty pounds of compressed air (three atmospheres absolute). The lives of carcinomatous strains are prolonged, in compressed air, spontaneous tumor incidence lags considerably behind that of controls in air at ordinary pressures, and tumor formations occur much later in life. The work of these investigators opens a new and very important field of endeavor in oxygen therapy.

The large number of conditions already treated by oxygen and oxygen enriched air points strongly to the universal nature of this substance as a therapeutic agent. The greatest drawback to the effective use of oxygen therapy at the present time is found in the ineffective manner in which oxygen is ordinarily administered. Face masks, inhalation tubes and oxygen tents are all more or less cumbersome, and imperfect devices. Barach found the tube and funnel method practically useless in administering oxygen. The nasal catheter gave oxygen concentrations varying from twenty-five to thirty-five per cent in the nasopharyngeal air. In none of the cases in which the nasal catheter was tried did the oxygen saturation of the arterial blood reach a normal level.

The same author administered forty to sixty per cent oxygen to a number of patients by means of the bed tent. While the arterial oxygen concentration was increased in each case, in only two out of sixteen was the oxygen concentration brought to the normal value. I have repeatedly filled considerable portions of both lungs of rabbits, anesthetized with chloretone, with a ten per cent mucilage of acacia. This colloid is non-absorbable by the lung epithelium and in from thirty to ninety minutes produces a severe arterial anoxemia with an oxygen saturation of forty per cent or less. When animals rendered thus anoxemic are put into compressed air at a pressure of twenty pounds above that of the atmosphere the anoxemia is invariably relieved in from thirty to sixty minutes, the arterial saturation becomes normal or increases to within a few per cent of this value and remains so as long as the animal is subjected to the higher oxygen tension. Very often the arterial oxygen saturation becomes several per cent higher than the normal value. This experiment demonstrates effectively the efficiency of oxygen administered in the form of compressed air in relieving an arterial anoxemia. Even the oxygen chamber which is admitedly the best method of administering oxygen enriched air at the present time does not furnish an atmosphere as effectively conditioned for the patients' comfort, in hot as well as in cold weather, as does the compressed air chamber.

The numerous results already published by many investigators amply justifies the use of oxygen therapy, in any of its forms, in the treatment of disease without further preliminary report or publication. We already have more premature data in medical literature than is useful. It seems to me that with the evidence now at hand physicians are justified in using oxygen, in the form of compressed air, in treating any condition in which oxygen therapy can be shown to be reasonably indicated or in which preliminary experimental evidence holds out promise of success.

———B———

TUBERCULOSIS ABSTRACTS

Light is a necessity to the life and well being of the cell. Sunlight contains, in addition to heat and light, other forms of radiant energy. Heliotherapy was practiced by the ancients. Hippocrates used it in the temple of Aesculapius;

Aristotle noted the effect of sunlight in producing green coloring in vegetable matter; Cicero describes the solaria which wealthy Roman citizens had constructed at their country villas; Celsus and Galen preached the salubrious effects of the sun. In 1779, Bertrand published his essay on "The Influence of Light on Living Organisms." In 1815, Loebel advised general, rather than local, insolation in cases of pulmonary tuberculosis, except in cases of hemoptysis. In the middle of the 18th century, Rickli established a clinic at Veldes, Austria, where patients were treated by insolation and fresh air with astonishing results. The discovery of the electric arc made artificial heliotherapy possible. Professor Finsen was the first scientist to practice actinotherapy by means of artificially produced rays and, in 1893, published his results of the treatment of tuberculosis (especially of the skin) by rays emitted from a carbon arc lamp, the "Finsen Light." In 1903, Rollier opened his first clinic for bone and joint diseases at Leysin, with brilliant results. The oldest of therapeutic agents has thus become one of the most modern.

Heliotherapy

Although Rollier lays stress on the importance of his Alpine environment, it is possible to offer patients the advantage of heliotherapy almost anywhere. Certain conditions, such as clouds, inclement weather, high winds and moist atmosphere, must be met in low altitudes. To meet these contingencies, different forms of artificial light, such as the various forms of quartz-mercury and arc-lamps are used.

Rollier ascribes the beneficial therapeutic action of the sun's rays chiefly to the ultra-violet rays of the spectrum. He and his followers measure success in the individual case by the degree of the pigmentation of the skin. Although the sun's rays produce degrees of pigmentation which vary within wide limits according to the characteristics of the individual's skin, whether the benefits to be derived from light treatment in tuberculosis and other diseases stands in a definite relationship to the degree of pigmentation, is quite another matter. While pigmentation is an undeniable response of the body to treatment, it is perhaps not to be relied upon as an accurate gauge of the patient's progress toward recovery. For this, we must still look to the condition of the affected part itself, as revealed by careful examination and, in the case of bones and joints, to roentgen-ray appearance. Perhaps the alterations of the patient's blood-picture is the most reliable measure of the defense reaction. The quartz-mercury-

The Sun Bath

vapor lamps produce ultra-violet rays in greater quantity than the sun itself, and in these lamps the heat or infra-red rays are almost entirely lacking. By the use of these lamps, on repeated exposure, an erythema may be obtained, which becomes continuous, and the skin becomes darker than before. It is spoken of frequently as pigmentation; but it is not the deep brown which the sun's rays produce in most skins. In patients who have acquired a deep tanning from exposure to the sun, it is not possible by means of the quartz lamp to prevent this pigmentation from fading away, nor is it possible in this manner to maintain the general improvement obtained from exposures to the sun. Ultra-violet rays alone are not a fair substitute for the rays of the sun in surgical tuberculosis.

It is not possible to show, at present, that ultra-violet rays of artificial production have marked curative value in the treatment of tuberculosis of bones and joints. The action of the quartz lamp is superficial, and it is an unsatisfactory substitute for sunlight. The im-

pression that the contrary is true as a result of which the more special orthopedic management of these cases is being omitted, is unfortunate and a calamity for many a patient.

The rejection of the quartz lamp as a satisfactory substitute for the sun is not to be accepted as a gesture of despair. Kisch, of Berlin, believes that the most important element of the solar light is to be found in the heat rays in the red and infra-red portions of the spectrum. He is convinced that their activity stands in direct relationship to the surface temperature produced, and that this must approximate that which is produced by the sun itself. However, it does not seem justifiable to ascribe the virtues of sunlight altogether to either ultra-violet rays or to heat, nor is either an acceptable or practical substitute.

Heliotherapy may be a marvelous addition to our resources, but it works no miracles; it brings to our aid no biological resources of unprecedented character; it produces no new cartilage; it makes the process of cicatrization no less necessary than hitherto. At the same time, by its beneficial action, cicatrization is made more sure and rapid. The wise application of such a well-established surgical procedure as immobilization through fixation is just as important as ever. With all its limitations, heliotherapy is a great addition to our resources, particularly in the tuberculous bone diseases of children.—Heliotherapy at Low Altitudes, A. H. Frieberg, Jour. of A. M. A., March 13, 1926, lxxxvi, 731.

Technique of the Sun Bath

After preliminary hardening and observation, if the patient's condition warrants it, the sun bath is begun. This is given with the patient in the recumbent position and not sooner than one hour, or better, two hours after the meal, and should be discontinued at least one-half hour to one hour before the meal.

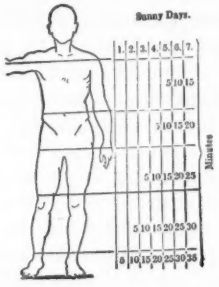
The first day, the feet are exposed for five minutes, then covered ten or fifteen minutes and another exposure for five minutes is given; covered again for ten, and exposed again for five. This is done front and back.

The second day, the feet are exposed for ten minutes and the knees for five; covered and uncovered three times front and back.

The third day, the feet are exposed fifteen minutes, the knees for ten minutes and the thighs for five; covered and uncovered three times, front and back.

The fourth day, five minutes' exposure is added to the feet, knees, and thighs, and the abdomen is given five minutes.

The fifth day, the previously exposed parts are given an additional five min-



Diagrammatic Course of Sun Cure as Suggested by Rollier

utes' exposure and the chest is given five for the first time.

Each day, a five-minute increase is given until the whole body is able to tolerate three or four hours daily of sun cure without burning. The progressive exposure is carried on to ascertain the patient's tolerance and to obtain pigmentation without burning. If, for any reason, the sun cure has to be interrupted during the preliminary exposure, the time of the next bath should be reduced to an earlier stage, the stage depending on the degree of interference.

Great care should be taken during the early exposures to avoid burning and to watch at all times for unfavorable symptoms, such as a rapid pulse, rise of temperature, headache, nausea, fatigue, dizziness, or other constitutional disturbance, which might indicate an intolerance to the sun or an exacerbation of the disease.

The baths are always given the same way without regard to the location of the lesion. The lesions should be kept covered until the patient has been able to take one or two hours of cure without any reaction. When the lesion is ex-

posed, it should be started at five minutes the first day, with five minute increases each day thereafter.

In the case of feeble patients or of those who do not tan well, or in cases where there is considerable fever, it may be necessary to reduce the time of daily exposure and to give only two or three minute increases daily. If any dermatitis or burning occurs, the treatment should be discontinued for two or three days. Sometimes, it is necessary to wait for a week or ten days.—Heliotherapy in Tuberculosis, C. L. Hyde, M. D., Ohio State Med. Jour., Dec. 1, 1925.

"A child with a tuberculous hip might be made a chronic invalid if light alone is given; whereas, if he is placed in proper orthopedic rest, with good food, fresh air and proper light treatment, usually he can be cured, sometimes with full function of the joint restored."

———R———

UNIVERSITY OF KANSAS CLINICS

The Treatment of Nephritis

DR. D. R. BLACK

The treatment of a given disease presupposes a careful consideration of the pathogenesis of the diseased organ, the fundamental physiology of the organ, and the pathological processes which have varied the normal physiology. In no other manner can rational therapy be instituted.

Let us then in our discussion of the treatment of nephritis at once establish a workable classification of nephritis, and have a common understanding of the function and physiology of the kidney and the manner in which certain types of inflammation and degeneration modify the normal function. Possibly the least confusing, and probably the most satisfactory classification, is Moschowitz's modification of the classification of Volhard and Fahr:

I. Nephrosis
   (a) Chronic parenchymatous nephritis (Degenerative)
   (b) Lipoid kidney
   (c) Amyloid kidney
   (d) Subacute glomerulonephritis
   (e) Unknown origin

II. Glomerulonephritis
   (a) Acute
   (b) Subacute
   (c) Chronic

III. Arteriocapillary fibrosis
   (a) With hypertension
   (b) Without hypertension

It is quite probable that the term nephosis has no pathological foundation, and, is therefore, dependent upon the type of degenerative lesion under consideration. Glomerulonephritis is a definite clinical entity and may be experimentally produced as shown by Duvall and Hubbard of Tulane University by certain endotoxins of scarlatinal streptococci presumably circulating in excess of the immune bodies established by the organism against these specific invaders. Typical histological lesions of glomerulonephritis in its various stages have been produced and studied.

It is, of course, known that the so-called embolic or focal nephritis may be produced at times by living organisms. Evidence has also been advanced to show the sequential relation of nephritis and arteriosclerosis to hypertension. The renal and extra-renal types of arteriosclerosis seen are the same and represent contemporaneous reactions to the same insult; namely, hypertension. The term arteriocapillary fibrosis is used to cover these pathological processes, in fact, recent work seems to indicate that chronic glomerulonephritis also represents a generalized capillary disease in which the renal lesion is the localized expression and perhaps the most predominating one, the hypertension being the direct result of the increased resistance due to capillary disease and that the sequential relation of hypertension to nephritis is only specious. Major feels that methyl guanidine, one of the end products of nitrogen metabolism, is responsible to a certain extent for hypertension, and that its long continued retention in so-called cases of essential hypertension eventually augments the nephritis, which always, sooner or later, develops in the cases who outlive such catastrophies as heart failure or cerebral hemorrhage. His experimental evidence is interesting and convincing, at least in so far as the etiology of the experimental hyperten-

sion is concerned, and his method of treatment by means of certain fractions of liver have produced remarkable experimental results and has been beneficial in seventy per cent of the cases of hypertension in which I have used the preparation.

The work of Starling and recently of Richards indicates that Cushing's modern therapy of kidney function furnishes the most satisfactory working basis for the physiology of the kidney. The essentials of the modern therapy with certain modifications of the above named authors are as follows:

The essentials of the process of urine production are physical, simply a process of filtration from the blood stream through Bowman's capsule and that the intra-capsular filtrate represents a deproteinized blood filtrate with the various salts and waste products in exactly the same concentration as in the blood. Reabsorption of certain salts occurs within the convoluted tubules in such a manner that under normal conditions the waste products of nitrogen metabolism are carried through intact and the salts and substances necessary to body economy are reabsorbed into the circulation in physiological amounts. The cells of the convoluted tubules are supposed to possess this selective activity. The process of filtration, of course, obeys the natural laws of all filters.

1. The density of the filter (e. g., the integrity of the glomeruli) and the pressure (blood pressure) being constant the rate of filtration will depend upon the character of the substance to be filtered.

2. The density of the filter and the substance to be filtered being constant the rate of filtration will depend upon the pressure.

3. The pressure and character of the substance to be filtered being constant the rate will depend upon the density of the filter.

Certain definite experimental data concerning the action of diuretics has been brought forward which deals primarily with rate and flow through the kidney and has as its fundamental basis the difference in caliber of the afferent and efferent vessels to the glomeruli, the efferent being smaller.

Adrenalin in small amounts constricts both vessels but not sufficiently to allow the factor of resistance in the efferent vessel to influence the increased pressure brought about by the same agent, consequently diuresis results. If larger doses of adrenalin are given the factor of resistance outweighs the factor of increased pressure and the opposite effect, anuria, is produced. The action of the so-called vasodilators work along the same lines.

As practical considerations one must keep in mind the fact that only about ⅓ of the 2,000,000 glomeruli function normally at a given time, and that from a standpoint of kidney function we should presuppose a very marked damage to the kidney before the ordinary kidney function tests would register. Many kidney function tests are designed to represent abnormality in certain functioning parts of the kidney. I think we will be safe in assuming those tests which have to do with the ability of the kidney to concentrate solids and those that show us the ability of the kidney to excrete waste products are most trustworthy. I usually rely upon the Mosenthal two hour test for specific gravity as a test for the ability to concentrate; the phenolsulphonephthalein test for glomerular function; and blood nitrogen level as a measure of the ability of the kidney to eliminate waste products; the examination of the urine substantiating these things, throwing light on the type of infective process going on in the kidney.

TREATMENT

One must realize in the beginning that the fundamental principle of treatment is based on the fact that a certain portion of the functioning kidney is dead and incapable of recovery, and that treatment must be directed along two lines:

1. To conserve the integrity of the remaining portion.

2. To prevent, if possible, the continuation of the processes which have originally damaged the kidney.

The one, therefore, embodying measures purely physiological to alleviate undue strain on the over-burdened remaining normal portion, but at the same time

to maintain as much normal cellular activity as is possible. This is usually done by diet, rest, diuretics, alkalies and acids.

The second, of course, deals with purely extra-renal facts—eradication of infections, chemical poisons, attention to circulatory influences and arteriosclerosis. Time will not permit a consideration of all the methods in use for treatment, and I would like to confine my remarks primarily to the alkaline method of treatment being used in Guy's Hospital. Certain substances known to be irritating to kidney epithelium should of course be omitted; for example, condiments, spices, excess of salt, and, insomuch as Newburg has demonstrated the injurious effects of prolonged protein feeding upon kidney epithelium, low protein diets should be used in all true nephritis and sclerotic lesions regardless of the blood nitrogen level. A possible exception is made in true nephrosis, a condition in which diets high in protein appear to have some merit.

THE ALKALINE TREATMENT

Alkali in the form of a solution containing equal parts of potassium citrate, potassium bicarbonate, sodii citrate and sodium bicarbonate, made up with peppermint water is given in doses aggregating about one grain to every 1.5 pounds of body weight. This mixture is given until the plasma carbonate is normal, and is maintained only in sufficient dosage to maintain a normal alkaline reserve. In severe cases, with anuria, it is well to utilize the thirst hunger method of Volherd in connection; namely, 600 c.c. of fluids daily, including fifty per cent as orange juice, for four days, or until the flow of urine is re-established.

It is a proven fact that cellular activity is associated with an increased hydrogen ion concentration and that the result of increased cellular activity or stimulation in the kidney is associated with diuresis. It has been shown by Stieglitz and Nusum that excessive alkali therapy produces renal injury and actively increases the acid bodies in the renal epithelium to a point of functional obstruction by swelling and edema. It has also been shown that rational alkaline therapy, keeping the hydrogen ion concentration of the blood within normal limits increases the efficiency of the kidney. We have here a paradoxical phenomena; namely, diuresis may be produced by either acids or alkalies, the practical point apparently being to find and maintain the proper reaction within the kidney epithelium for its maximum. Most of the acid and salts now in use, and certainly the mineral salts, are adapted more closely to circulatory conditions, and their real efficiency depends upon their ability to relieve cardiac edema. Cases of injury by alkalosis are rare and few of us have ever seen a case of alkaline tetany. The idea seems somewhat hypothetical; provided, the conditions of treatment outlined above are followed.

It is common knowledge that in all cases of nephritis there is a decrease of the plasma carbonate and that in most cases there is an increase in alkaline tolerance. From a practical standpoint it is therefore essential to know the plasma carbonate while treating a case of nephritis, because in no other manner can we gauge the dose of alkalies to be given; also, to safeguard the possibility of producing renal injury or alkalosis. In general it may be said that cases of nephritis with edema and cases in which the urinary volume is below normal will derive marked benefit by giving alkalies in amounts sufficient to produce normal blood carbonate. In favorable cases a marked diuresis and subsidence of edema occur when this point has been reached. Naturally the best results are to be expected in chronic parenchymatous nephritis and subacute glomerulonephritis. Alkalies have little or no influence on vascular or interstitial nephritis. As a matter of fact no therapeutic agents have much influence on these cases, except possibly iodides, low protein, low salt, non-irritating diets and rest. Acute nephritis presents some difficult aspects. In the early stages the plasma carbonate is normal. It is here that the above mentioned hunger thirst treatment is valuable in connection with sweating, absolute rest, very small doses of digitalis, and perhaps in obstinate cases, veniotomy, and occasionally lumbar puncture. Under two conditions in acute nephritis are alkalies indicated:

1. In absolute suppression of urine.
2. After the case has developed into a subacute nephritis with evidence of some parenchymatous change.

In any case of non-obstructive anuria it is advisable to use alkalies until flow is re-established regardless of condition of blood.

Cases of pure lipoid nephrosis (Epstein's disease) are uncommon. They are characterized by weakness, anemia, edema, normal blood pressure, slight, if any, elevation in blood nitrogen, marked albuminuria and cylinduria, low blood protein, and a reversal of the serum globulin to serum albumin ratio, and increased blood cholesterol. Epstein's idea of the production of edema in these cases has been that the loss of blood protein as albumin in the urine decreases the osmotic pressure of the blood rendering it less than that of the tissues, consequently the current of fluid flow would be from blood to tissues. He advises for this reason high protein diets, 2 to 3 grams per kilo body weight. In severe cases blood transfusion is used and he has reported excellent results by this treatment.

Loeb adheres more closely to Widal's original idea of chloride retention and offers a hypothetical, and perhaps practical explanation of chloride retention. He assumes that in the process of degeneration occurring in the tubules certain tonic protein substances are liberated into the blood stream which produce a fixation of chlorides within the tissues making, as under the terms of Epstein's theory, the current of fluid flow from the blood stream to the tissues. Evidence is accumulating from therapeutic reports in the literature in treatment of nephrosis with high protein diets to support Epstein's hypothesis, although I feel the question is still debatable.

I would like to emphasize a point of practical importance in connection with the nephritis of advanced arteriosclerosis and hypertension, namely, the influence of passive congestion in the kidney due to cardiac failure. Frequently the albuminuria of such cases will clear up as if by magic by rest and small doses of digitalis. This calls to mind an anecdote in the life of the late Sir William Osler. He once said "that the most embarrassing moment of his professional life was when he was confronted by an old patient in good health whom he had told twenty years ago that he would die in six months of Bright's disease because he had a high blood pressure and albumin in his urine."

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Irradiation and the Blood

The enthusiasms that have been aroused by the demonstrable physiologic potency of irradiation with ultraviolet rays generated in various ways call for restraint before they are permitted to promote therapeutic procedures that may presently be discovered to be ill advised. Not long ago it was shown that the exposure of dogs to carbon arc radiation may give rise to variable results with respect to the changes in the content of erythrocytes in the blood. Depending on the dosage, increases and decreases were noted. A continuation of this work shows that changes in the plasma volume also may take place. The investigators believe that erythrocytes may actually be destroyed by excessive irradiation with massive exposures. Our uncertain knowledge in regard to the effects of irradiation should serve as a warning against undue ventures that may actually border on quackery, until further explicit knowledge is available. (J.A.M.A., October 6, '28.)

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Liver Treatment in Spine

From reports it appears that anemia of sprue in which there is a high color index and fewer than 2,000,000 erythrocytes can be expected to respond to the administration of Minot's liver fraction (Liver Extract No. 343, N.N.R.) with a shower of reticulocytes, unless the bone marrow is hypoplastic. Clinical cure, apparently, follows, but the type of pernicious anemia persists for at least two months after liver extract has been administered. A recent report of a case of sprue treated with Liver Extract No. 343, N.N.R. refers to a patient who was admitted to the hospital in a moribund condition and who has apparently recovered completely. (J.A.M.A., October 6, '28.)

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ETHICAL ADVERTISING

The time is rapidly approaching when newspapers will be governed in the acceptance of advertising matter by the same ethical principles that now govern the state medical journals, the same ethical principles, in fact, that have governed the members of the medical profession in their relations with the people and with each other for at least three quarters of a century. When the newspaper publishers have accepted and digested these principles they will understand why regular physicians have not extensively used their advertising space.

The outstanding features of ethical advertising are that it shall contain no misrepresentations, that it shall contain no exaggerated or unwarranted claims, and nothing that may be unfair to others in the same line of business.

Merchants usually advertise the things they have to sell. Professional men have nothing to sell but their services. In what way can a physician or surgeon advertise his services that will meet these requirements and still assure sufficient returns to justify the expenditure? A doctor's personal equipment may be evidence of his ability to render excellent service, but to advertise it would not only provoke ridicule for his egotism and lack of modesty but would raise the suspicion of exaggerated or unwarranted claims. Ones office equipment may be regarded as evidence of ability to render satisfactory service, but this sort of equipment is merely a matter of cash or credit and a great many doctors have accumulated thousands of dollars worth of instruments of precision and therapeutic appliances and apparatus that they have neither time nor occasion to use. To advertise it would raise the question of misrepresentation.

According to the higher standard of advertising ethics which will ultimately be the common standard there is no way in which a doctor can advertise himself in the newspapers with any prospect of satisfactory returns on his investment.

The medical profession, however, has something to sell to the people that it can advertise and should advertise. The American Medical Association, several of the state societies and various other medical organizations have been conducting publicity campaigns of various kinds for the purpose of selling scientific medicine to the people. In these campaigns, newspaper space is used quite freely, whenever the material is regarded in the light of news or the paper shows a friendly interest in the advancement of health measures. Except in a few states very little money has been spent in the purchase of advertising space. The large dailies are sufficiently independent that their editors may ignore, to a considerable extent at least, the particular interests of their advertisers. The smaller papers, however, especially the county weeklies, must carefully nurse their advertising patrons.

Many of the editors of these are patrons of regular doctors and friendly to scientific medicine, but they receive considerable revenue from the advertisement of quacks and patent medicines. The amount of advertising the regular doctors do would not buy the ink to print the paper.

The influence of these small papers is particularly worth having, especially in our campaign for better legislation and also in our educational campaign. While an individual physician cannot ethically or profitably advertise himself, the medical profession of a nation or a state or the members of a county society can advertise scientific medicine. They can ethically and profitably use advertising space to tell the people what scientific medicine has done for them, how it has accomplished the eradication of nearly all contagious diseases; to tell them about some of the procedures by which theories of disease have been established as facts or have been replaced by facts, and how scientific methods of treatment have been discovered.

When the story of the scientific procedures by which you have been convinced has been retold in plain language that the people can understand they also will be convinced. Advertisements of this kind will not profit one man only but the benefits will accrue to all of the exponents of scientific medicine in the community served by the paper. County societies will find it to their advantage to investigate this matter and give it more than casual consideration.

CAUSES OF DEATH

Mortality statistics are generally regarded as of considerable value. Tabulated returns from large territories have established the importance of methods of prevention as well as methods of treatment in numerous diseases. Nevertheless it has to be admitted that our mortality statistics under present conditions cannot be accurate, for in entirely too many instances the cause of death as stated by the attending physician is simply one of several probable or possible causes of death, under the conditions found. Physicians are frequently required to certify to the cause of death in cases in which no history could be obtained and the physical findings were so limited and indefinite or so disguised by approaching death that a diagnosis was impossible.

In some of the large hospitals where autopsies are held on all those who die in the hospital, a considerable number of errors in diagnosis and unexpected causes of death are discovered. Such being the case it is obvious that too few autopsies are made.

This is partly due to sentiment on the part of the friends of the deceased, but more largely due to the timidity of the attending physician, fearing to offend some of those bereaved. In many such cases the relatives would like to know the cause of death and would readily give their consent if asked for it, sometimes they even suggest it themselves. There are occasions when the attending physician has no time to hold an autopsy, there are also occasions when he may prefer not to have such a test of his accuracy in diagnosis; there are also occasions when the friends of the deceased prefer that the cause of death be not made known.

None of these things, however, should interfere with legitimate efforts to improve the accuracy of mortality records. It seems reasonable that autopsies in all cases where the cause of death is at all in question should be given official sanction. This could be accomplished by making a slight amendment to the laws which prescribe the duties of a coroner. It could be provided that the coroner should

order an autopsy in any case of death when the cause is not definitely known and either the attending physician or the nearest relative or friend of the deceased requests him to do so.

One wonders, if a bill providing for such an amendment were introduced in the next session of the legislature, if the strongest opposition to its adoption would come from members of the medical profession or from the people of the state. If such an amendment were adopted, would the medical profession or the people avail themselves of its provisions for the purpose of scientific accuracy, or would they only take advantage of it when there were disputes between attending physicians, or when the family and friends of the deceased were dissatisfied with the diagnosis and treatment?

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CHIPS

A recently published medical dictionary authorizes the use of the term "acute abdomen" but restricts it to "any acute condition within the abdomen calling for immediate operation."

Franklin W. White, New England Journal of Medicine, October 11, says: "The mere presence of gall stones is not an indication for operation, many silent stones show a gall bladder wall that is bacteriologically negative, cholesterin stones especially lie dormant for years. Surgery should be based on symptoms, not on the mere presence of stones or low grade infection. I believe that most of such patients escape perceptible injury to other organs."

Decreasing birth rates seem to be the rule now. England had a lowered birth rate in 1927. In the United States the rate has been falling since 1915, but there has also been a steady fall in the death rate. Various opinions have been given as to the causal factors and as to what a continued decrease in birth rates portends. Living conditions are held as responsible by some. The apparently growing practice of birth control is also credited with being an important factor. Back of it all is the growing independence of women. Women who are capable of self support are in a position to determine, at least to a large extent, the number of their own contributions to the human race.

Upon the theory that migraine is due to spasm and subsequent dilatation of the cerebral arterioles and that the spasm is evolved by nervous impulses reaching the cerebral vessels through the sympathetic nerves, Tzanck began the use of ergotamine tartrate, a depressor of the sympathetic, in these cases. His results as reported seem to justify further clinical trials of the drug. It is administered by mouth, 2 mg daily, and an additional 2 mg when an attack is threatened. The cases treated showed improvement, the intervals between attacks were considerably lengthened. In some of the cases attacks could be aborted by early administration. If not more than 2 mg per day was given no ill effects were observed. Cases of gangrene following the administration of this drug have been reported, so that careful supervision of the treatment is advised.

The recent popularity of ephedrine in the treatment of asthma and hay fever, and its indiscriminate use, have brought to light some of the ill effects to be expected from its administration. Numerous cases have now been reported where alarming symptoms have been produced, especially in patients with cardiac disease. Bloedorn and Dickens, in the September number of the Archives of Internal Medicine, state that ephedrine is a dangerous drug to use when patients show evidence of cardiac damage. Careful diagnosis to distinguish between bronchial asthma and cardiac asthma should be made. Ephedrine may produce cardiac decompensation they claim. The drug should be discontinued in patients who show palpitation, tachycardia, arrythmia or vasomotor disturbances.

One frequently finds in the current medical literature the expression, "a shift to the left in Arneth's count" in reference to certain blood pictures. In 1904 Arneth suggested a method of

classification of neutrophils in a differential blood count. He divided these into five groups: 1. Those with round or indented nucleus, constituting five per cent normally. 2. Those with two nuclear divisions, constituting thirty-five per cent. 3. Those having three nuclear divisions, constituting forty-one per cent. 4. Those having four nuclear divisions, constituting seventeen per cent. 5. Those having five or more nuclear divisions, constituting .two per cent. These percentages are fairly constant in health, but may show marked variations in disease without a change in the total leukocyte count. When the percentage in the lower classes is increased at the expense of the higher there is said to be a shift to the left. In arriving at what is termed an "Arneth index" the percentages of the first two groups and one-half the percentage in the third group are added together. This gives an average normal index of 60. An increase of this index is a shift to the left.

More recently Schilling suggested a modification of Arneth's method which apparently simplifies the laboratory procedure. He divides the neutrophils into four groups: 1. Myelocytes. 2. Young forms. 3. Staff forms, with T, U or V shaped nucleus. 4. Those with a segmented nucleus. In infections there is first an increase in staff forms, and with a moderate stimulus there is an increase in young forms, and with a strong stimulus there is a marked increase in young forms and also an increase in myelocytes. It is customary in recording the count to write the names of the groups in regular order from left to right—myelocytes, young forms, staff forms, segmented forms. An increase in young forms and myelocytes is a shift to the left. Niehaus, Medical Clinics of North America, September, has reported some observations on the value of the Arneth-Schilling count and concludes that it may be of considerable value in prognosis in cases of infection.

G. Arbour Stephens, a consulting cardiologist to King Edward VII Welsh National Memorial Association and consulting physician to several hospitals, has an article in the October number of the Medical Review of Reviews in which he suggests that fleas are responsible for rheumatic fever and rheumatic heart disease. He recapitulates his argument as follows: 1. Heart disease occurs only in those children who do not partake of milk, and possess a perverted appetite for the acids, such as vinegar and lemons. 2. The children of this sub-class are very attractive to fleas and react badly to their bites. 3. The part of the world where fleas and rheumatic heart disease are found are coextensive. He also suggests that the flea is an intermediate host for some parasitic protozoon. He offers no clinical evidence to support his premises nor any experimental evidence that rheumatic fever can be produced by flea bites. Few practitioners with experience will accept his assumptions or his conclusions.

The following is taken from the address of Frank I. Ridge, M.D., President-elect of the Missouri Medical Association, published in the Journal of that organization:

"The present day diagnostic clinic heart specialist does not listen to a heart or take a pulse. As a matter of fact, he may not even see you. A technician, perhaps a high school graduate, hooks you up and tunes you in on a radio-like machine. The specialist sees a movie photograph of your static reaction and tells you that you are suffering because of a bloc in your right bundle branch. So much and no more. That is your diagnosis—the machine makes it clear.

"On the other hand, when you go to your home physician he will watch your breathing, take a look at your ears, your finger nails and your ankles. Ears and finger nails can tell one much about a heart function. He will find out how far you can walk and how many pillows are necessary for sleep. He will actually feel your pulse and listen to your heart and lungs. If you mention your right branch bundle bloc he will tell you that he is not sure whether it is right branch, big creek, or the southeast quarter, but he is sure that your heart is not working efficiently. Then he will set about to steady your heart, relieve your liver con-

gestion, stimulate your kidneys, regulate your diet, and pull your circulation together. He will give you more treatment than diagnosis, but you will feel better. He also knows the diagnosis. True, his work is not nearly so dramatic or so impressive a show as that of the clinic specialist who graduated two years ago and since then has been working solely on electrical mechanical reactions."

Dr. J. T. Scott of St. John has compiled some diet lists that ought to appeal to the doctors for their convenience in prescribing diets for their patients. There are three of these lists. One is for a normal diet, another is for a reducing diet and the third is useful in the acid ash and acetone types of acidosis. In these lists all the foods permissible for each meal are listed and the patient selects from the list a certain number of the foods he desires. The amount of each food allowed is also stated so that the total food selected will have the proper caloric value.

Communications

Editor, Journal of the Kansas Medical Society, Topeka, Kansas.

It is not my intention to comment upon the policy of the Medical School with respect to the Orthopedic Clinics, the one established at Pittsburg, Kansas, in particular; however, I wish to say that apparently Dr. Howard E. Marshbanks, in his letter to the Journal of October, 1928, is not entirely informed concerning the real status of handling patients at that Clinic.

Dr. Marshbanks makes the statement, in that letter, that the patient who applies for consultation at the clinic and who is seen by the specialist does so with the knowledge of his physician and that no patient is seen without the doctor's knowledge; and that the Crawford County Medical Society controls the details of management and selection of patients who are legitimate subjects for the clinic.

I wish to say, in reply to that, that the mother of one of my patients, a young boy of twelve years who was suffering from subacute osteomyelitis, heard about the Pittsburg Clinic and without my knowledge was seen by the specialist and the mother advised as to treatment.

I think that the territory that the Pittsburg Clinic is intended to cover would be a great deal more benefited if the Crawford County physicians were relieved of the responsibility of controlling the details and management of selecting legitimate patients for the clinic and, instead of that, the specialist be requested to ask the patient for a letter from the physician who has charge of the case.

Respectfully,

J. A. KNOOP, M.D.

SOCIETIES

NORTHEAST KANSAS MEDICAL SOCIETY

The regular fall meeting of the Northeast Kansas Medical Society was held in Lawrence on Thursday, October 25. The following program was presented:

Dr. V. M. Auchard—Post Operative Tetanus.
Dr. G. W. Jones—Gastric Ulcer.
Dr. J. B. Henry—Gas Bacillus.
Dr. H. L. Chambers—Fracture of Radius, Open Treatment.
Dr. R. H. Edmiston—Hypertension.
Dr. H. T. Jones—Fracture of Tibia.
Dr. M. T. Sudler—Tertiary Syphilis.
Dinner at 6:45 p. m.
Dr. L. P. Engle of Kansas City, Mo.—The Classification and Treatment of Goiter.

DICKINSON COUNTY SOCIETY

The Dickinson County Medical Society met at Abilene, Kansas, on October 18 as guests of the Abilene doctors for supper. Those present were Drs. Turner and Klingberg of Hope, Dr. Chaffee of Talmadge, Dr. Greenlee of Chapman, Dr. Kroesh of Enterprise, Dr. Entz of Woodbine, Dr. Petersen of Herington, Drs. Conklin Sr., Dieter, Hines, Witmer, Steelsmith of Abilene. Dr. Alfred O'Donnell, councilor for our district, was present and read a paper on "Penetrating Wounds of the Abdomen Through the Rectum."

On motion it was decided to hold the next meeting in honor of Dr. J. A. Ketcherside who has been in active practice for over 55 years. This meeting will be at Hope.

The following officers were elected: Dr. T. R. Conklin, Sr., President; Dr. C. N. Chaffee, Vice President; Dr. Daniel Petersen, Secretary-Treasurer; Dr. H. R. Turner, Delegate; Dr. W. A. Klingberg, Censor.

DANIEL PETERSON, M.D., Secretary.

Kansas Medical Auxiliary

AUXILIARIES OF KANSAS STATE MEDICAL SOCIETY

First District

Brown-Nemaha Auxiliary—13 members.
Pres.—Mrs. W. W. Nye, 614 Shawnee Ave., Hiawatha.
Sec.—Mrs. F. J. Austin, 704 Miami

Ave., Hiawatha.
Treas.—Mrs. H. J. Lowry, Morrill.

Sixth District

Sedgwick County Auxiliary—37 members.
Pres.—D. W. Basham, 824 N. Emporia, Wichita.
Treas.—Mrs. Opie Swope, 245 Pershing, Wichita.

Eighth District

Saline-Ottawa County Auxiliary—24 members.
Pres.—Mrs. J. K. Harvey, Salina.
Sec.—Mrs. Porter Brown, Salina.
Treas.—Mrs. C. M. Jenney, Salina.

Ninth District

Norton-Decatur County Auxiliary—7 members.
Pres.—Mrs. J. H. A. Peck, St. Francis.
Sec.—Mrs. F. J. Walz, St. Francis.

Tenth District

Central Kansas Auxiliary—22 members.
Pres.—Mrs. J. B. Carter, Wilson.
Sec.—Mrs. V. R. Parker, Natoma.
Treas.—Mrs. D. R. Stoner, Ellis.

Members at large—47.

Sedgwick County Auxiliary is putting on a membership campaign. This auxiliary though organized only last May, has planned its programs for the year, and had them printed for each member's convenience. The first meeting is in the form of a reception for the nurses in training at the various hospitals, to be given at Wichita Country Club on October 16.

Dr. F. A. Carmichael, Superintendent Osawatomie State Hospital, will give a lecture on Heredity, illustrated with slides, on November 19, under the auspices of Twentieth Century Club which numbers more than 600. One program is based upon clippings from Hygeia. This auxiliary hopes to enroll every woman eligible for membership before the close of the year.

Mrs. D. W. Bashan, Pres.

DEATHS

John Higbee Johnson, Wichita, aged 68, died September 4 of paralytic ileus. He graduated from the Kansas City Medical College, Kansas City, Missouri, in 1890. Was formerly a member of the faculty of the College of Physicians and Surgeons, Kansas City, Mo.

William E. H. Lemon, Olathe, aged 82, died July 21 of angina pectoris. He graduated from the Homeopathic Medical College of Missouri in 1874.

James Henry Seaton, Newton, aged 89, died August 7 of cerebral hemorrhage. He graduated from the Kentucky School of Medicine, Louisville, in 1866.

BOOKS

Urology, a textbook for students and practitioners by Danial N. Eisendrath, M.D., assistant professor of surgery Rush Medical College; and Harry C. Rolnick, M.D., associate urologist, Mt. Sinai Hospital, Chicago. Published by J. B. Lippincott Company, Philadelphia.

The authors have spared no pains in making this book of service to the general practitioner as well as the urologist. The anatomy and physiology of the urinary tract have been carefully reviewed. The technic of examination has been carefully explained. The diseases of the urinary tract have been described and the most important points in differentiation have also been noted. Considerable space is given to surgical procedures and these are carefully described and well illustrated. Among the illustrations, which are numerous, a large number of roentgenograms are shown.

A practical Medical Dictionary by Thomas Lathrop Stedman, A.M., M.D., Tenth revised edition. Published by William Wood and Company, New York. Price $7.50.

This dictionary contains five hundred new medical terms and a good many added definitions of older ones. Usage seems to legitimatize the misuse of the English language in a ridiculous manner, for instance, in this edition the term "acute abdomen" is authorized. A dictionary is accepted as authority for the use of terms and one naturally wonders if those who prepare these books might not better ignore such misusage of words as that. This dictionary is complete, is made up with thumb index and flexible cover, and being just published contains most all of the new words.

International Clinics, a quarterly of illustrated clinical lectures and specially prepared articles edited by Henry W. Cattell, M.D., with the collaboration of numerous others. Volume III, thirty-eighth series, 1928. Published by J. B. Lippincott Company, Philadelphia.

Sajous has an article in this number dealing with rational endocrinology and

organotherapy as foundations for greater efficiency in practice. Pearl has an article on alcohol and life duration; he also discusses the subject of cancer from the viewpoint of the human biologist. Rolleston of England has an article on the clinical significance of abnormal blood pressure. Held and Gross discuss the medical treatment of liver and biliary duct. Porter discusses the composition and dietary value of vitamines. Piersol describes the visceral manifestations of syphilis. There are several other very interesting papers on subjects quite as important as these.

The Medical Clinics of North America, September, 1928. Published bimonthly by W. B. Saunders Company, Philadelphia. Price per clinic year, paper $12.00, cloth $16.00.

The contributions to this number of the Clinics are all from men connected with the University of Nebraska College of Medicine. There are twenty-two contributors and the subjects discussed are: Hypothyroidism; gastrojejunocolic fistula; tetany following thyroidectomy; physical examination of the heart; glycosuria, thyroid disease and diabetes; subacute bacterial endocarditis; two cases of widely different types of pulmonary tuberculosis; value of leukocyte counts according to Arneth-Schilling method; otitic brain abscess; ocular complications of diabetes; disturbances in growth; pyelonephritis; granuloma coccidioides; goiter; chronic infectious arthritis; the undernourished child; abdominal pain in children with upper respiratory infections; the great omentum; perforation of the small bowel; orthopedic measures in the treatment of arthritis; vomiting in children.

Syphilis, acquired and heredosyphilis by Charles C. Dennie, B.S., M.D., assistant professor of dermatology and syphilology, University of Kansas School of Medicine, etc. Published by Harper and Brothers, New York. Price $2.50.

The author writes largely from his own experience and presents his observations in a very simple and lucid style. He discusses the pathology of the disease, the various diagnostic procedures, the peculiar characteristics manifested by its invasion of various organs and systems of the body. Various methods of treatment are carefully described, with indications and contraindications for use. The subject seems to have been quite thoroughly covered.

Criteria for the Classification and Diagnosis of Heart Disease, by a committee appointed by The Heart Committee of the New York Tuberculosis and Health Association, Inc. Published by Paul B. Hoeber, Inc., 76 Fifth Avenue, New York. Price $1.50.

The aim of the book is to facilitate the making of records which will aid the clinician in making more accurate diagnoses and also to make such records of value to other clinicians, because, when made in accord with the classification and nomenclature outlined here, all clinicians using such records will be "talking a common language."

A Text Book of Surgery. By W. Wayne Babcock, M.D., F.A.C.S., professor of surgery and of clinical surgery in the Temple University, Philadelphia; surgeon to the Samaritan Hospital and to the American Hospital for Diseases of the Stomach. Octavo of 1367 pages with 1050 illustrations, 9 of them in colors. Philadelphia and London: W. B. Saunders Company, 1928. Cloth $10.00 net.

New text books on surgery will continue to appear as long as new facts are discovered and new methods supplant the old. New books that describe the newer methods are just as necessary as new instruments or equipment. The author has done much toward the further advancement of surgery in preparing this work. It presents the modern conceptions of surgical pathology as well as the modern surgical procedures. It is a complete text on the subject.

Essentials of Prescription Writing. By Cary Eggleston, M.D., assistant professor of clinical medicine, Cornell University, Medical School. Fourth edition, revised. 16mo of 153 pages. Philadelphia and London: W. B. Saunders Co., 1928. Cloth, $1.50 net.

This is just a little book that one can put in his pocket, but its importance is entirely out of proportion to its size. It is not a book of prescriptions but a text on prescription writing. There is some very important information concerning the use of Latin though the author encourages the use of English in prescriptions. He also encourages the use of the metric system and has devoted considerable space to it. We can all get something worth while out of this little book

Admiral Grayson Heads Gorgas Memorial

Washington, D. C., November 1, 1928. —(Special) — Formally accepting the presidency of the Gorgas Memorial Institute which was recently tendered to him at the annual meeting of the Board of Directors held in Boston on October 10, Rear Admiral Cary T. Grayson announced today that it would be his purpose to maintain the field operations of the organization and to expand its publicity features as far as funds will permit.

"The plan of sending out trained speakers to appear before leadership groups of the various cities of the country in 'caravan' health trips will be continued," he said. "To close the gap between the public and scientific medicine by a tremendous health educational campaign is an imperative issue. We will continue to work in this direction by added newspaper publicity, radio talks, poster service, health crops organizations, and by platform appearances."

Admiral Grayson's application for retirement from the active list of the Navy, effective November 1, has been acted upon favorably by President Coolidge, so that he will be able to devote his entire time to the Memorial activities. President Coolidge is the Honorary President of the Gorgas Memorial. The Surgeon Generals of the United States Public Health Service, Army and Navy, are on the Board of Directors.

———B———

The Precursor of Vitamin D: Ergosterol

Following the discovery that foods may be made antirachitic by irradiation with ultraviolet light, it was shown that the substance which is activated by the rays is ergosterol. A percursor to vitamin D had thus become established. Activated ergosterol was shown to be a hundred thousand times as effective from the standpoint of its effects on rachitic animals, as cod liver oil. This irradiated ergosterol needs careful standardization and evaluation in terms of curative potency, because an excessive dose may cause "hypermineralization" in the blood in the normal as well as the rachitic infant. The usual dose in infants for cure thus far has been given in the form of oil solutions containing the equivalent of from 2.5 to 5 mg. of iradiated ergosterol. Evidence has been presented which sterngthens the assumption that only a molecular structure such as that possessed by ergosterol enables a sterol to be photo-chamically converted into vitamin D, and confirms the view that ergosterol is the specific parent substance of vitamin D. Fortunately, there need be no limitations to its availability for therapeutic use if this is finally established on a sound basis. (J.A.M.A., October 13, '28.)

———B———

Ovarian Hormones and Ovarian Organotherapy

The evidence from the experimental laboratories and the clinics, accumulated especially during the last few decades, points to the conclusion that the mammalian ovaries exercise their influence on the so-called secondary sex characters and the sex life of the mammalian female through the mechanism of the hormones produced by some element in the ovary. It is therefore rational to treat or attempt to treat symptoms due or presumably due to ovarian insufficiency by substitution therapy. Summing up the extensive clinical trials with ovarian preparations, generally administered orally, Novak, in 1924, stated that the results are rarely striking and often nil to the level-headed observer. Much work has been done on the separation and concentration of the so-called follicular ovarian hormone and preparations have been obtained which, when administered parenterally, are reliably reported to stimulate uterine growth and to introduce changes similar to estrus in sprayed animals. To date the use of such preparations on patients has been neither extensive nor encouraging. The various ovarian hormone preparations that now seem sufficiently purified to be introduced hypodermically without serious results to the patients should be given trial in definitely uncomplicated ovarian deficiency in order that more may be learned as to their actual effects. (J.A.M.A., October 20, '28.)

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Commendable Research

The growing activities of commercial firms in chemo-therapeutic research, in

collaboration with universities and clinics, has led to much favorable comment on the part of the medical profession. Never has there been a time in the history of medicine when such important research developments have taken place, and are now under way.

As an example of what can be accomplished, the Abbott Laboratories, North Chicago, Ill., has, during the past ten years, taken a place in the front rank of pharmaceutical manufacturers through its successful research work. It is understood that this firm, together with its subsidiary, the Dermatological Research Laboratories of Philadelphia, expended over $100,000 in research work in the year 1927. New and important discoveries for the use of the medical profession have resulted from these scientific investigations and other work is in progress.

A new scholarship for chemo-therapeutic research at Northwestern Medical School of Chicago has just been announced by Dr. Alfred S. Burdick, President of the Abbott Laboratories.

℞

Meralgia Paraesthetica

Byron Stookey, New York (J.A.M.A., May 26, 1928), says that meralgia paraesthetica is a true traumatic neuritis of the external cutaneous nerve. Sharp angulation of the external cutaneous nerve as it leaves the pelvis is a low grade constant trauma to the nerve, which eventually produces irritation of the nerve and finally physiologic interruption. The syndrome and the mechanism correspond closely with that found in brachial plexus neuritis caused by abnormal angulation of the inner cord over a cervical rib, or ulnar neuritis caused by abnormal angulation of the ulnar nerve at the elbow due to fracture of the humeral condyles. Its treatment consists in section of the nerve at the exit from the pelvis without excision, the nerve ends being left in alinement so that spontaneous regeneration and subsequent nerve lengthening may take place. The term "meralgia paraesthetica" is little known; perhaps less confusion would occur were a more descriptive term, such as "neuritis of the external cutaneous nerve," used instead of "meralgia paraesthetica." Furthermore, the term "algia" is seldom applied when there are objective disturbances in sensation, such as are commonly found in this disease. In conformity with accepted usage, the term "neuritis" and not "algia" should be used.

℞

Ectropion of Lower Eyelids Following Burns and Scalds: New Early Pathognomonic Sign

Cicatrical ectropion of the lower eyelids is a frequent and serious result of burns and scalds involving the face about the eyes. By no means all burns of this area result in ectropion. When recognized early, before the condition is well established, simple preventive measures may abort the process. Therefore it is important to diagnose this complication at the earliest possible moment. The sign described here is, in the opinion of Samuel Gordon Berkow, Perth Amboy, N. J. (J.A.M.A., May 26, 1928), the first positive manifestation of cicatricial ectropion of the lower eyelids, following burn or scald. To determine whether the eyelids are sufficiently involved for cicatricial ectropion to result, the patient is instructed to roll the eyeballs inward and upward; or a finger is placed on the patient's forehead between the eyes, and the patient is instructed to try to look up at the finger. As the eyeballs roll inward and upward, if a space, or interval, forms between a lower eyelid and the corresponding eyeball in the outer (lateral or external) third of the palpebral aperture, and persists as long as the eyeballs are kept in the upward and inward position, cicatricial ectropion is to be ex pected. Preventive measures should be instituted at once. These failing, there will next be angulation of the involved eyelid, followed by eversion of the ciliated lid margin, and then true ectropion.

℞

RELAXATIVES

✣ ✣ ✣

Where will the girls be vaccinated now?

✣ ✣ ✣

"A specialist is a man who knows more and more about less and less."

✣ ✣ ✣

"The new patient in Ward B is very good-looking," said the nurse.

"Yes," agreed the matron, "but don't wash his face. He's had that done by four nurses this morning."

Diet and Theophylline in Treatment of Cardiac Failure

Further observations made by Fred M. Smith, Iowa City (J.A.M.A., Oct. 27, 1928), on a largely milk and carbohydrate diet previously reported have emphasized the importance of this feature in the treatment of cardiac failure. A greater significance is attributed to the carbohydrates and particularly the sugars of the diet. It is also suggested that the beneficial action of the carbohydrates on the liver injury induced by prolonged congestive failure may contribute to the effectiveness of the diet. Intravenous administration of dextrose solution is not advocated if the patient is able to take food by mouth. It is felt that the diet is a more effective means of providing sugars. Theophylline is a valuable measure in the treatment of the cardiac failure of arteriosclerosis. The best results are obtained in the congestive type of failure. Experimental and clinical observations support the belief that the elimination of fluid is promoted by the favorable influence on the coronary circulation. Theophylline in doses of 2 or 3 grains (0.13 or 0.2 Gm.) after meals has repeatedly been administered throughout the period of hospitalization and in some instances was continued after the patient returned home. There have been very few complaints of abdominal discomfort which could be attributed to the drug.

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RELAXATIVES

"So you met Alice today?"
"Yes; I hadn't seen her for ten years."
"Has she kept her girlish figure?"
"Kept it? She's doubled it."

✣ ✣ ✣

Wealth is a thing the earth is made to yield
By toil in factory, forest, mine and field;
And poverty is born when men abuse
A primal law—take more than they can use.

—Walt Drummond.

———℞———

EARLY REMINISCENCES

"A Dental Specialist"

There were no Dentists in those days,
  And everybody knew it.
The Doctor could not treat a tooth,
  All he could do was pull it.
Each Doctor had his "Pullicons,"
  A word that's now quite rare,
But when there were no dentists,
  You could hear it everywhere.

Old Uncle Billy Hastings came
  To call on me one day,
He talked and talked, then talked some more,
  And finally blurted—"Say,
I have a front tooth down below,
  That's gettin' mighty loose,
And more than that it interferes,
  When I spit 'baccer juice'."
"I just came in to ask you
  If you're feelin' real stout,
And if you are, I sort o' think
  I'd like to have it out."
He spread his mouth from ear to ear,
  The snag almost dropped out;
I touched it with my finger and
  The old man gave a shout.
"Hold up," said he, "don't handle it,
  "I'm touchy 'bout my mouth,
Right now she's feelin' dryer
  Than a long mid-summer drought.
I'll step into the drug store,
  But soon return, I think,
It would be a good idea
  To take a little drink."
He sallied forth, was gone some time,
  A half hour near about,
Then came in smiling, took a seat,
  "I'm ready, take her out."
I needed not a forcep—
  To my fingers it gave way;
I fear he would have choked on it,
  If left another day.
I held the snag before his face,
  With satisfaction lit,
"Well, I declare," the old man said,
  "It didn't hurt a bit.
"Now what's your bill, I'm ready
  To pay you what is due."
"Well, I'll not charge you anything
  For doing that for you."
"That's cheap enough—When I get sick
  I'll now know what to do—
Just call a messenger and send
  Him hurriedly for you."

J. T. SCOTT, M.D.

FOR SALE—A $12,000 unopposed general practice, excellent farming community, in modern town, collection 90%, price $3,500, includes modern residence which has been used as hospital for last 5 years, x-ray and hospital equipment included, terms can be arranged, immediate possession, specializing. J. B. Ungles, M.D., Satanta, Kansas.

USED EQUIPMENT FOR SALE—Fischer Diathermy Model FO; Deep Therapy Lamp; X-Ray Tube Stand; Vulcan Coil; Morse Wave Generator. J. N. Ristey, 911 Holmes, Kansas City, Mo.; Factory Representative; H. G. Fischer & Co.

FOR SALE—Epsteins microsaccharimeter, haemacytometer, coagulometer, tuning forks, percussion hammer, scales, galvanic battery, vibrator, ear heater, obstetrical forceps, needle holders, syringes, electric fan and other instruments.—Mrs. G. H. Newton, Fairbury, Nebr.

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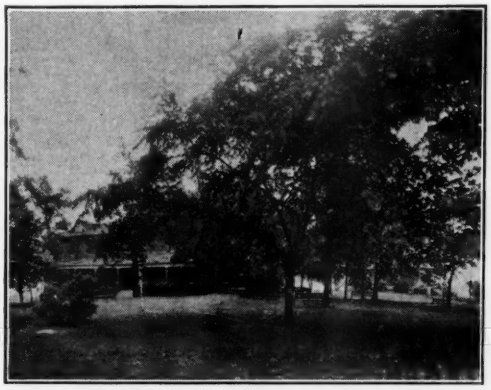

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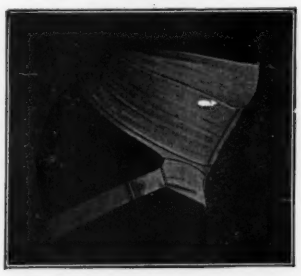

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The Journal of the Kansas Medical Society reviews the Manual in the Sept. issue as follows—

The author has presented here in a very convenient pocket manual what every practitioner ought to know about blood pressure. He describes the best methods for determining the blood pressure and he has very carefully stated the significance of the various deviations from the average normal. To the conclusions drawn from his own extensive experience he has added many valuable data from the literature on the subject. One is impressed with the thoroughness, the accuracy and the conciseness with which he has covered this important subject.

Dr. B. B. Grover, author of a book on Blood Pressure comments as follows:—

With considerable interest I have read your Manual on Blood Pressure and it appears to cover quite well the essentials in such a manner that the busy physician will not only read it but profit thereby. Your little book is a valuable contribution to blood pressure literature.

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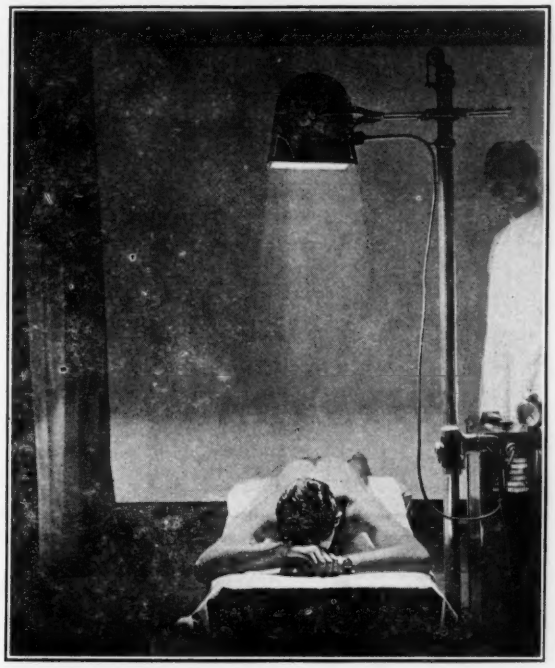
—E. P. CUMBERBATCH
M.B., D.M.R.E., M.R.C.P.

From a paper read before the Southport Division of the British Medical Assn., March 30, 1928. (British Med. Jour., July 14, 1928)



Reprint No. 587 of the above article in full will be sent on request.

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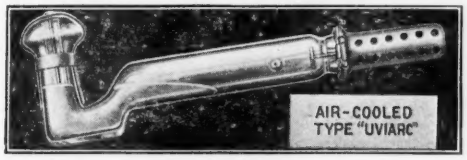

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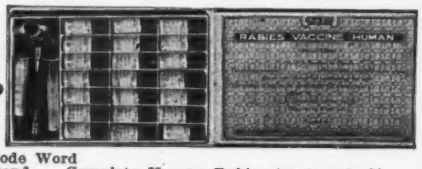

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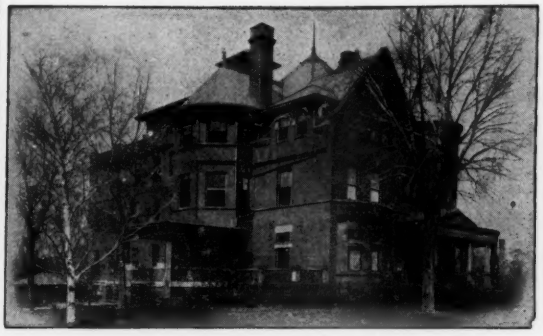

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"Why do they call it a mite box, Mother?"

"Because," chirped in the brother, "you might put something in it and you might not."

"The biologic department of California University, Los Angeles, has added a special department for the study of a flagellated type of parasite, known as Chilomastic." The name sounds cool and palatable.

✣ ✣ ✣

"Casey," said Pat, "how do yez tell th' age of a tu-u-rkey?"

"Oi can always tell by the teeth," said Casey.

"By the teeth," exclaimed Pat. "But a turkey has no teeth."

"No," admitted Casey, "but Oi have."

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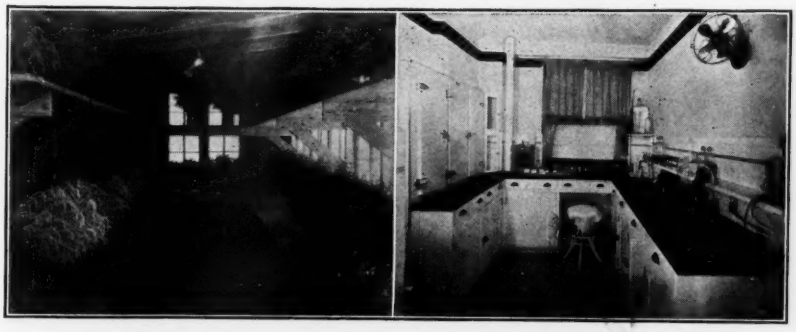

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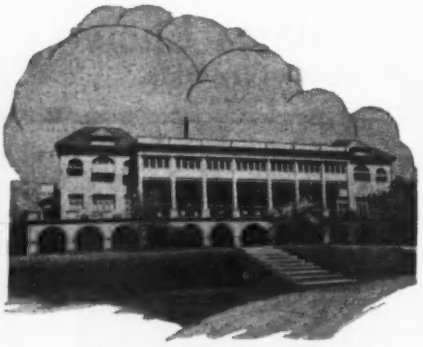

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Members of Component County Societies are members of the Kansas Medical Society. Physicians residing in counties where no County Society exists may join the society of an adjoining county. Physicians residing where no County Society exists, who are members of a district or other independent society approved by the Council, may be admitted to membership.

ANNUAL DUES $5.00, due on or before February 1st of each year.
Dues should be paid to the Secretary of the Component County Society, or, if not a member of a County Society, to the Secretary of the Kansas Medical Society.

OFFICERS FOR 1928

COUNTY	PRESIDENT	SECRETARY	MEETINGS HELD
Allen	C. B. Stephens, Iola	P. S. Mitchell, Iola	
Anderson	W. E. Hare, Garnett	A. J. Turner, Garnett	2nd Wednesday
Atchison	Geo. W. Allaman, Atchison	Virgil Morrison, Atchison	1st Wed. ex. July and August
Barton	B. S. Pennington, Hoisington	L. R. McGill, Hoisington	1st Tuesday, Jan., Apr., June, Oct.
Bourbon	C. L. Mosley, Fort Scott	W. S. Gooch, Fort Scott	2nd Monday
Brown	F. J. Austin, Hiawatha	Edw. K. Lawrence, Hiawatha	2nd Friday
Butler	W. E. Janes, Eureka	J. M. Devereaux, El Dorado	2nd Friday
Central Kansas	O. A. Hennerich, Hays	P. K. Meade, Hays, Kan.	Dec., March, June, Sept.
Cherokee	R. C. Lowdermilk, Galena	W. H. Iliff, Baxter Springs	2nd Monday
Clay	C. C. Stillman, Morganville	X. Olsen, Clay Center	2nd Wednesday
Cloud	Andrew Struble, Glasco	R. E. Weaver, Concordia	Last Thursday
Coffey	H. T. Salisbury, Burlington	A. B. McConnell, Burlington	
Cowley	S. J. Guy, Winfield	C. A. Kelley, Winfield	1st Tues. ex. July, Aug., Sept.
Crawford	C. S. Newman, Pittsburg	M. Mehrl, Pittsburg	3rd Thursday
Decatur-Norton	J. A. H. Peck, St. Francis	Walter Stephenson, Norton	Called
Dickinson	H. R. Turner, Hope	D. Peterson, Herington	
Doniphan		W. M. Boone, Highland	1st Tues. Jan., Apr., July, Oct.
Douglas	J. B. Henry, Lawrence	R. B. Hutchinson, Lawrence	1st Thursday
Elk	R. C. Harner, Howard	F. L. Depew, Howard	Called
Finney	C. Rewerts, Garden City	O. W. Miner, Garden City	
Ford	C. E. Bandy, Bucklin	W. F. Pine, Dodge City	Last Wednesday
Franklin	J. R. Scott, Ottawa	J. A. Dyer, Ottawa	
Harper	C. E. Ressler, Anthony	A. E. Walker, Anthony	3rd Wed., Mar., June, Sept., Dec.
Harvey	J. W. Campbell, Halstead	J. H. Enns, Newton	1st Monday
Jackson	M. S. McGrew, Holton	C. A. Wyatt, Holton	1st Wed., Jan., Apr., July, Oct.
Jewell	J. E. Hawley, Burr Oak	C. W. Inge, Formosa	
Johnson	A. L. Ludwick, Overland Park	D. E. Bronson, Olathe	Second Monday
Kingman	R. W. Springer, Kingman	H. E. Haskins, Kingman	
Labette	N. C. Morrow, Parsons	J. T. Narcmore, Parsons	2nd Thursday ex. summer months
Leavenworth	G. R. Combs, Leavenworth	J. L. Everhardy, Leavenworth	4th Wednesday
Lincoln		M. Newlon, Lincoln	1st Monday
Linn	D. E. Green, Pleasanton	H. L. Clarke, LaCygne	2nd Thursday
Lyon	J. A. Woodmansee, Emporia	M. A. Finley, Emporia	1st Tuesday
Marion	A. E. Eitzen, Hillsboro	E. H. Johnson, Peabody	1st Tuesday
Marshall	J. W. Randell, Marysville	H. Hearle, Marysville	2nd Wednesday
Meade-Seward		C. Trekell, Liberal	Last Thurs., July, Oct., Jan., Apr.
Miami	P. F. Gatly, Louisburg	J. W. Kelly, Louisburg	Second Tuesday
Mitchell		E. E. Brewer, Beloit	
Montgomery	T. A. Smith, Independence	J. A. Pinkston, Independence	
McPherson	L. T. Quantius, McPherson	Clinton R. Lytle, McPherson	2nd Wednesday
Nemaha	D. H. Fitzgerald, Kelly	S. Murdock, Jr., Sabetha	
Neosho	S. G. Ashley, Chanute	V. A. Butin, Chanute	Last Thursday every other month
Osborne	J. E. Henshall, Osborne	S. J. Schwaup, Osborne	Second Monday
Ottawa	L. M. Hinshaw, Bennington	C. M. Vermillion, Minneapolis	
Pawnee	G. S. Weaver, Larned	C. E. Sheppard, Larned	
Pratt		W. F. Bernstorf, Pratt	2nd Tuesday
Reno	B. L. Greever, Hutchinson	C. A. Boyd, Hutchinson	1st Monday
Republic	L. O. Nordstrom, Belleville	H. D. Thomas, Belleville	4th Friday
Rice	M. Trueheart, Sterling	T. R. Ross, Sterling	2nd Thursday in November
Riley	W. M. Reitzel, Manhattan	R. G. Schoonhoven, Manhattan	Last Thursday
Rush-Ness	J. E. Attwood, La Crosse	L. L. Dyche, Utica	First Monday
Saline	E. J. Lutz, Salina	Leo Schafer, Salina	
Sedgwick	C. A. Parker, Wichita	W. J. Eilerts, Wichita	2nd Thursday
Shawnee	F. C. Boggs, Topeka	E. G. Brown, Topeka	1st and 3rd Tuesday
Smith	D. W. Relihan, Smith Center	V. E. Watts, Smith Center	1st Monday
Stafford	F. W. Tretbar, Stafford	J. T. Scott, St. John	Second Thursday
Sumner	J. A. Burnett, Caldwell	C. H. Dillon, Wellington	2nd Wednesday
Washington		W. M. Earnest, Washington	Last Thursday every quarter
Wilson	J. W. McGuire, Neodesha	E. C. Duncon, Fredonia	
Woodson	S. N. Murphy, Yates Center	Geo. R. Lee, Yates Center	2nd Monday
Wyandotte	J. W. Sparks, Kansas City	H. W. King, Kansas City	Every 2nd Tues. ex. summer months

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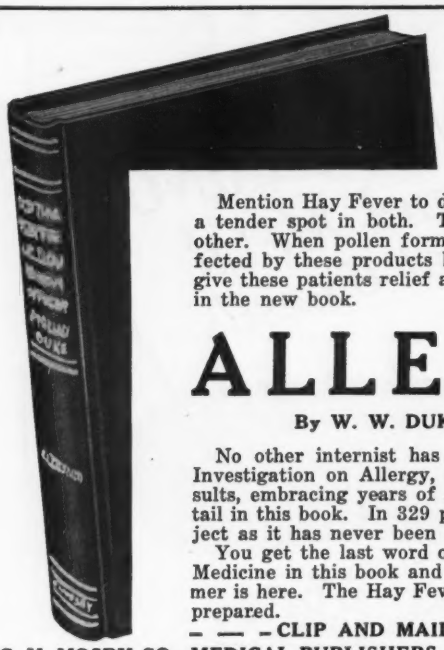

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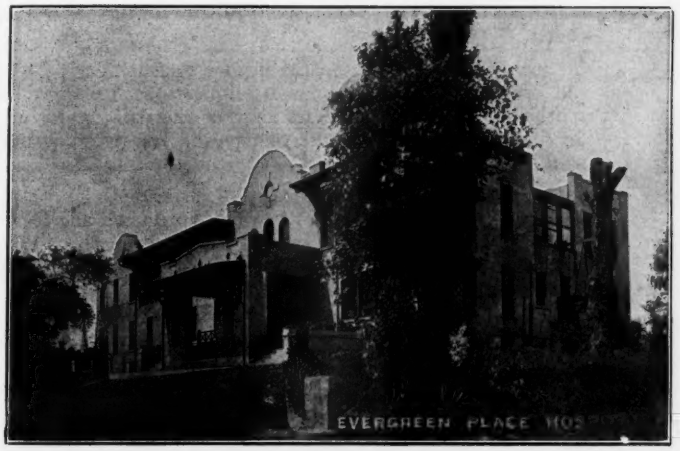

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DR. FRANK B. FUSON, Supt.

5 POINTS in favor of GERRY service to oculists

It is the purpose of this company to co-operate to the fullest extent with legitimate oculists. Here are five points about Gerry service which we believe merit your consideration.

1. Optical prescription work for the Eye physician exclusively.
2. One grade of prescription service and that the best at all times.
3. A strictly ethical concern where the Oculist can send his prescriptions feeling certain that they will receive careful attention, accurate inspection and be dispensed from the highest grade of materials.
4. Quality, service and responsibility placed above cut prices and special discounts.
5. An educational advertising campaign, to the general public, in the interest of Oculists.

O. H. GERRY OPTICAL COMPANY

Manufacturing Opticians

2ND FLOOR GRAND AVENUE TEMPLE

KANSAS CITY, MO.

M-1

"The Line Test"
In Infant Feeding

IF medicine had been born a complete science; if the law of variation could be suspended, it is conceivable that the sum and total of human knowledge could be encompassed in a single volume, the science of medicine could consider its conquests complete and its responsibilities for further research ended.

But this is not the case. Exceptions constantly appear, the old order is found to possess its limitations, necessity, the mother of invention, provides another and still greater urge. So finality is always in the offing—the last word is never spoken.

It was the recognition of the law of variation that prompted the assertion that each infant is a law unto itself and feeding must be adjusted to its individual needs. Even then, exceptions arose, they still arise and from these necessities, progress in the art of infant feeding and science in the preparation of infant diet materials emerges.

Resources are valuable only as they are assembled to serve greater and ever varying ends. To exercise his own resources to their fullest extent, to enjoy the selective principle with the utmost freedom, the physician demands a latitude in the choice of dietary materials at his disposal, just as infants demand a wide variation to suit their needs.

This then, is the test, not a single product, but a *line* of infant diet materials that increases the range and scope of the physician's skill just as it increases our alertness and zest to serve his needs.

Dextri-Maltose—A highly assimilable carbohydrate for cow's milk modifications.

Recolac—A reconstructed milk for traveling or where the milk supply is faulty.

Casec—The principal protein of cow's milk, for the correction of fermentative diarrhoea.

Cod Liver Oil—Standardized as to potency, produced exclusively from Newfoundland Cod.

Protein Milk—Now available in a form that is boilable for a 10-minute period.

Malt Soup Stock—For use in cases of an idiosyncrasy against carbohydrate.

Lactic Acid Milk—Uniform in composition and acidity, flows freely, no curds.

Florena—A wheat flour especially useful for Butterflour or Butter Soup Mixtures.

Powdered Milk—Clean milk of known origin, tuberculin tested, low bacteria count.

Samples and Literature on Request.

MEAD JOHNSON & COMPANY

EVANSVILLE, INDIANA, U. S. A.